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ETNOLOGISKA STUDIER

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1936

L. Götterberg.

Utgivare:

Fil. dr. WALTER KAUDERN

INTENDENT VID GÖTEBORGS MUSEUM, ETNOGRAFISKA AVDELNINGEN

Etnologiska Studier.

Published once or twice a year. Annual subscription kr. 15:—. Orders to Dr Walter Kaudern, Gothenburg Ethnographical Museum, Göteborg (Sweden).

Ethnological Studies 1, Göteborg 1935. Contents:

- Walter Kaudern*, Notes on plaited anklets in Central Celebes (with 14 figures), pp. 5—25.
Stig Rydén, Skalpierung bei den Tobaindianern (with 2 figures), pp. 26—34.
Henry Wassén, Notes on Southern Groups of Chocó Indians in Colombia (with 40 figures), pp. 35—182.

Ethnological Studies 2, Göteborg 1936. Contents:

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Rafael Karsten, Arrow-poisons and narcotics in Western Amazonas, pp. 68—77.
Walter Kaudern, Notes on plaited anklets in Central Celebes 2 (with 2 figures), pp. 78—83.

Ethnological Studies 3, Göteborg 1936. Contents:

- Stig Rydén*, Archaeological Researches in the Department of La Candelaria (Prov. Salta, Argentina), pp. 5—329 (with 150 figures).
C. G. Santesson and *Henry Wassén*, Some Observations on South American Arrow-poisons and Narcotics, pp. 330—358.

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1936

Edited by:

WALTER KAUDERN, Ph. D.

DIRECTOR, ETHNOGRAPHICAL DEPARTMENT, GOTHENBURG MUSEUM



GÖTEBORG 1936
ELANDERS BOKTRYCKERI AKTIEBOLAG

CONTENTS

	Page
STIG RYDÉN, <i>Archaeological Researches in the Department of La Candelaria (Prov. Salta Argentina)</i>	5—329
C. G. SANTESSON and HENRY WASSÉN, <i>Some Observations on South American Arrow-poisons and Narcotics (A rejoinder to Professor Rafael Karsten)</i>	330—358

Archaeological Researches

In the Department of

La Candelaria

(Prov. Salta, Argentina)

By

Stig Rydén

With two appendices by Prof.
J. VILH. HULTKRANTZ and
WALTER KAUDERN, Ph. D.

To
My Parents

PREFACE.

In the present treatise are published the results of the archaeological researches that I had the opportunity of carrying out, in 1932, in the Department of La Candelaria, in the Argentine Province of Salta. These researches occupied two periods of time, amounting in all to nearly two months.

The idea of my undertaking an expedition of this kind originated with the then director of the Ethnographical and Archaeological University Museum of Tucuman, Professor A. MÉTRAUX. My research work was subsequently carried out in close co-operation with the said institution, and to its energetic principal I am greatly indebted for his obliging assistance as well as for the so kind hospitality that he and his wife extended to me during my sojourn in Tucuman.

For my expedition actually becoming a reality I have above all to thank my late tutor, Professor Baron ERLAND NORDENSKIÖLD. Personally I had no adequate means at my disposal, and of travelling in South America I possessed no experience whatever. In word and in deed he assisted me in realizing my travelling projects, and with most especial gratitude do I remember the interest he showed me while lying on the sick-bed that was to prove his death-bed.

To Mr. KNUT J:SON MARK, to the Curators of the Royal and Hvitfeldt Scholarship Foundation, to the Trustees of the Gothenburg Museum — all of whom have in different ways contributed to making my expedition financially possible — and to Consul-General AXEL A:SON JOHNSON, who so kindly granted me free passages and freight on his ships, I wish to express my sincere and respectful thanks.

The assistance given me by the above-mentioned gentlemen was all the more valuable seeing that it was forthcoming at a time of financial depression.

For various presents towards my equipment I have to thank the late Mr. CARL HÖJER, Mr. ERNST H. JANSSON, and Mrs. SIGNE ZIEGLER.

I have in very grateful recollection the whole-hearted hospitality I received by the family of Sr. JOSÉ ASTIGUETA, in La Candelaria. I also owe a debt of gratitude to Sr. ANDRÉ CAMPANELLA, Secretary of the Tucuman University Museum, Sr. JULIO ECHENIQUE, Commissioner in La Candelaria, Professor RUDOLF SCHREITER and Sr. CÉSAR SENEZ, of Tucuman, Mr. PEDRO SVENSSON, the Swedish Consul-General at Buenos Aires, as well as to many museum officials and private persons in Buenos Aires, La Plata, Tucuman and La Candelaria, who in some way or other lent me a helping hand in the planning of my travels, in the prosecution of my researches, or in studying the material collected.

For kindly giving me their assistance in connection with special examination, here in Sweden, of certain details of my collections I am indebted to KARL ALMSTRÖM, Ph. D., the Borough Analyst of Gothenburg, Dr. O. FORSELIUS, Prosecutor at the Sahlgrenska Sjukhuset, Gothenburg, Professor J. VILH. HULTKRANTZ, of the Uppsala University, WALTER KAUDERN, Ph. D., Director of the Ethnographical Section of the Gothenburg Museum, and to NILS G. ODHNER, Ph. D., of the Zoological Section of the Riksmuseum, Stockholm. Very special thanks I owe to Docent SVEN LOVÉN, Ph. D., for most valuable advice given me in the working up of my present treatise.

For enabling me to get my collections preserved I have to thank the Curators of the Royal and Hvitfeldt Scholarship Foundation. As in working up and preserving the material I was at first practically limited to my private means, the work could only proceed at a very slow rate.

It was only through having been granted the requisite funds from the Foundation that I was able to complete this work within a reasonable time. In this connection I also extend my hearty thanks to Mr. AUGUST AHLSTRÖM and Mr. BJÖRN THÖRNBORG, attendants at the Gothenburg Museum, for having in various spells assisted in the preservation work, and to the artist, Mr. AXEL HJELM, for having executed the majority of the drawings that are here published.

The printing costs have been defrayed by generous contributions from Alderman and Mrs. ERNST COLLIANDER and from the Royal and Hvitfeldt Foundation, while the Museum Director, Dr. W. KAUDERN, has been kind enough to allot space for my treatise in the periodical, »Ethnological Studies», of which he is the editor, and in that connection he has undertaken to bear part of the cost of the printing. For this help towards my publishing expenses I am most grateful.

I also wish to thank Mr. MAGNUS LEIJER and Mr. TOR FERNHOLM, of Gothenburg, for having, respectively, carried out the translation of my manuscript into English and its proof-reading, while my thanks are also due to the officials of the Gothenburg Municipal Library, who spared no pains in procuring me the necessary literature — often very difficult of access — as well as to Mr. NILS HELLNER, director of the printing firm, for all the obligingness he has shown me both on this occasion and previously.

Gothenburg in September, 1936.

Stig Rydén.

I.

The department of La Candelaria, its physical geography, and climatic conditions affecting its archaeological sites.

The department known as La Candelaria occupies the southeastern portion of the province of Salta. The name of Candelaria applies to the department and also to its most important centre and watercourse.

The Province of Salta itself presents two different types of Argentine landscape. In the west it is formed into a highland by the Andes, while its eastern part is a lowland which in many respects recalls the Chaco. The department of La Candelaria may be described as a borderland where these two landscape types meet and pass into one another. In the department of La Candelaria one finds, it is true, the flora and fauna of the Chaco, but the country is not flat, as in the Chaco proper, but broken. The hills of La Candelaria anticipate, so to speak, the mountain country in the west.

In the province of Tucuman¹⁾ the Aconquija mountain range constitutes a sharply defined border line between the high and the low country. A spur of the range, Cumbres de Calchaquies, extends into the province of Salta where it forms a northern continuation of this border line. Immediately east of this line is the archaeological territory that will be dealt with in the following pages.

For the department of La Candelaria a natural border in the east is provided by a range of mountains known as the

¹⁾ Where not otherwise expressly stated, in this paper the «Province of Tucuman» refers to the present section of Argentina known by that name.

Sierra de la Candelaria, which forms a part of Sierra de Medina (cf. map, fig. 6), which runs mainly from north to south. This mountain complex, which is isolated from the highland proper, constitutes the last outpost of the Andes towards the east. The department of La Candelaria includes part of the valley between Sierra de Medina and the main highland.

High up in the Sierra de la Candelaria are found the headwaters of the Rio Candelaria, the river that, with its affluents, drains the entire eastern portion of the department. From the Sierra de Medina the ground slopes westwards, down to the Rio Tala whose course runs along the bottom of the valley separating the Sierra de Medina from the highland proper in the west. This slope is interrupted by hills and minor ranges, of which the largest and most imposing is Loma Colorada. This range I have also heard called Sierrito Infernillo, but in order to avoid any possible confusion I shall adhere to the former name, which is used by SCHREITER (1) in his paper on the archaeology of La Candelaria. In this connection it may, perhaps, also be mentioned that no exact map of the district here dealt with is in existence, and for this reason not only the sketch map in fig. 6 but also place names are to some extent uncertain.

In the Chaco itself, as we know, no stones whatever are found. In the department of La Candelaria, however, with its mountainous parts, the Indian inhabitants have had access to stone material. Thus the Indians have been able to manufacture axes and other implements of stone, whereby their culture resembles that of the Diaguitas rather than that of the Chaco tribes.

In La Candelaria the watercourses form a highly characteristic feature of the landscape. As a result of the heavy rainfall of the summer, all the rivers and streams run at the bottom of deeply cut ravines, called barrancas.

I mentioned that the Rio Candelaria is a tributary on the left hand to the Rio Tala, or Rio Sali — as it is called far-

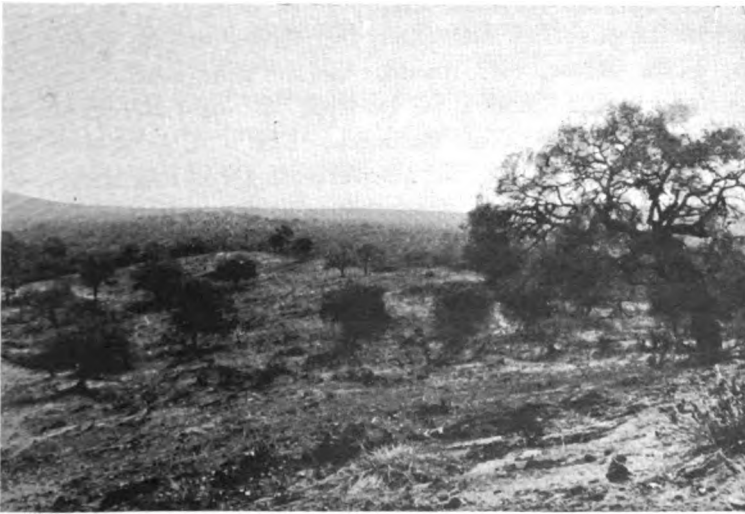


Fig. 1—2. Two landscape views from La Candelaria. Looking respectively north and northwest from the slopes of Sierra de la Candelaria near the archaeological site of Unquillo. In the upper picture Loma Colorada is seen on the left.

ther down — in the province of Tucuman. Parallel to this river there ran in former days the important route that from Tucuman led up to Salta, and thence farther on to the high-plateau round Titicaca, and to Peru. The proximity of this highway, connecting Peru — the most important colony of the Spanish colonial dominion in South America — with the estuary of the Plata River, the great entry gate on the eastern coast of the continent, must have meant a great deal to the Indian population of La Candelaria. The Spaniards always made use of the Indians settled in the vicinity of roads for transport work along them. The Spanish conquerors were hard taskmasters, and the presence of such a highway may well be supposed to have contributed to a rapid depopulation of the settlements in La Candelaria, in case they were still inhabited at the time of the Spanish conquest. In our days the railway runs along this valley, which has accordingly taken the ancient highway's place as the transport carrier between the high-plateau around Titicaca and the metropolis that has come into being at the mouth of the Plata River, viz. Buenos Aires. The railway station nearest to La Candelaria is Ruiz de los Llanos, about 80 kilometres north of Tucuman. The station is situated at an altitude of 823 m. above sea-level (AMBROSETTI, 4, p. 7).

I will here, although very briefly, touch upon the La Candelarian flora and fauna of the present time. This is necessary in order to understand under what natural conditions one may suppose that the Indian population of La Candelaria formerly existed. For the specific determination and Latin names of plants as well as animals here referred to I am indebted to Professor R. SCHREITER, of the Tucuman University, and I may mention that a more detailed description of the flora and fauna of La Candelaria is found in his paper on the archaeology of that district (SCHREITER, 1). As regards climatic conditions, in addition to what is mentioned below, I would refer the reader to SCHMIEDER'S (pp. 359—

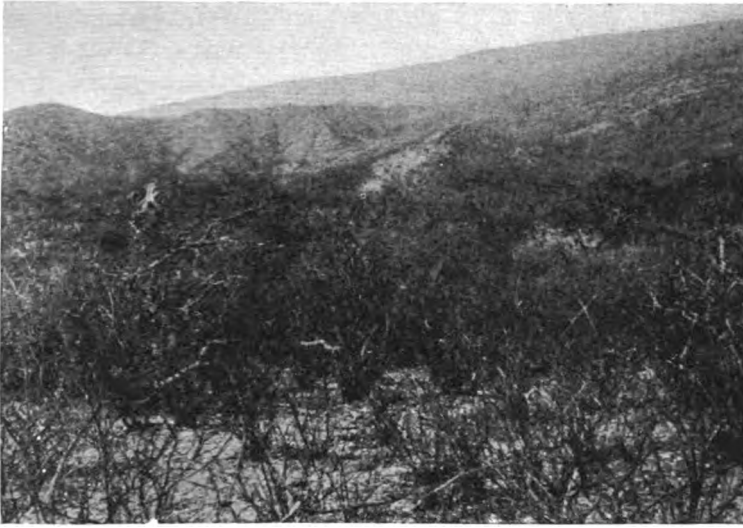


Fig. 3. The western slope of Sierra de la Candelaria, as seen from Unquillo.

361) historical and geographical essay on the ancient Spanish province of Tucuman.

Wherever the forest-grown or shrub-covered ground has not had to give place to the cultivation of Indian corn, the vegetation largely consists of algarrobo trees (*Prosopis*), churqui (*Acacia*), quebracho (*Schinopsis balansae*, *Aspidosperma quebracho-blanco* and *quebracho-colorado*), cebil (*Piptadenia macrocarpa*), mistol (*Zizyphus mistol*), chañar (*Gourliea decorticans*), etc. In addition there are several species of cactus, the fruits of which must have been of importance for Indian domestic economy. Similarly it may be supposed that the Indians turned to practical use the sparsely occurring caraguata plant, the fibres of whose leaves give a suitable raw material for string. This in its turn was used in the manufacture of satchels and other knitted work, just as in our days is the case among the Indians of the Chaco. The vegetation is, on the whole, more dense in low-lying places. As one ascends the hills, the thick undergrowth

generally disappears. The undergrowth as a rule being an obstacle to a free view, and thus hampering photography. I am here only publishing landscape views taken from points at a higher elevation (figs. 1—5). Hence they may perhaps tend to present a one-sided and in some degree misleading picture of the natural scenery of the localities where the finds here dealt with were made.

Among the animals of importance to Indians may be mentioned the chuña (*Chunga burmeisteri* and *Cariama cristata*), several different species of partridges, the armadillo, and also pigeons, the charata (*Ortalis canicollis*), the ostrich-like rhea (*Rhea americana*), the viscacha (*Viscacia*), and the peccary (*Dicotyles* sp.). The guanaco is nowadays extinct, but the memory of its existence is perpetuated in certain place-names, e. g. Huanacocha. Of predatory animals there are the puma, wild cat, and fox. A species of snail found in these regions has also been of a certain importance to the Indians, having supplied a material for ornaments. To this I will recur later.

The sharp difference between summer and winter as regards rainfall has had a great deal to do with the location of archaeological sites. Most of the ancient sites are found on the top or on the slopes of hills or ranges of elevated ground. Whether this choice of dwelling sites at a high elevation was due to the comparative dryness of the summer months (the rains), or to the ease of guarding and defence against enemies, I leave an open question. The circumstance that the majority of the ancient dwelling sites that I examined were situated on high ground admits also of another explanation. The fact is that the heavy rains wash away the soil from the top and sides of the hills, and then deposit it in layers covering more low-lying sites. Thus it is found that more elevated dwelling sites are characterized by masses of pottery fragments scattered all over the area formerly inhabited. Such fragments are however also found on the adjacent slope down which the rain-water has run off. Here

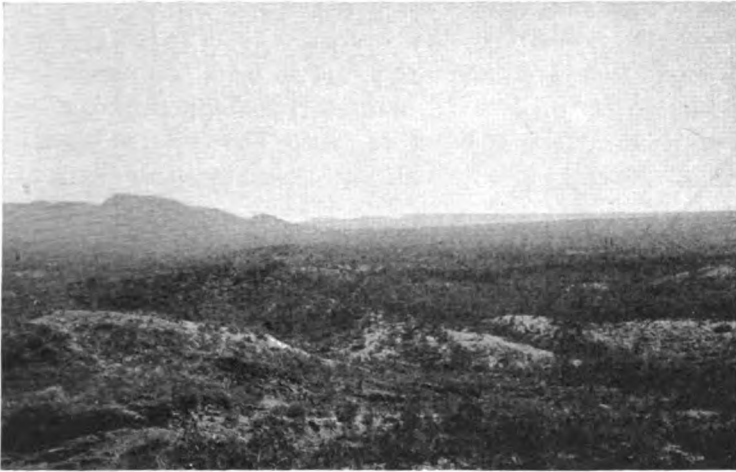


Fig. 4. View of the valley between Sierra de la Candelaria and Loma Colorada, seen from the slope of Sierra de la Candelaria near Unquillo.

no dwellings ever existed, the potsherds having been distributed over the area in question by the down-streaming storm water. Here and there in dwelling sites may also be seen grinding stones thrown askew by the rushing waters by which the embedding soil has been washed away. In sites situated on very high ground, in most cases only the bottom portions of sepulchral urns remain in situ. I take this opportunity of pointing out that burial in La Candelaria anciently consisted of *direct urn-burial on the dwelling site*. In consequence of this annual moving of masses of soil from high to low ground, low-lying dwelling sites are concealed underneath a thick layer of earth. Dwelling sites of this category are revealed only when situated close to a watercourse. As I have already mentioned, streams and rivulets are nearly always found at the bottom of steeply-banked gullies, especially when they flow through sections of flat country. Low-lying dwelling sites are therefore often discovered only when the water of some stream by its eroding effect has laid

bare a sepulchral urn or an archaeological stratum. As has already been observed, the concentration of settlement upon elevated ground is therefore probably merely apparent, and is due to the fact that it more seldom happens that a low-lying dwelling site is bared to view. The elevated sites, on the other hand, have remained uncovered ever since the day they were abandoned.

I may at once mention that the department of La Candelaria is extremely rich in archaeological remains. Almost everywhere one finds stray pottery fragments which have been washed away from the dwelling sites by the rain water. It is characteristic of the ancient sites that the entire area of settlement is strewn with potsherds, while here and there lies a grinding stone, a stone axe, and so on. Nearly every hillside and piece of elevated ground was once inhabited, and to the excavator the question frequently presents itself as to what formed the subsistence of all these people who left behind them such a wealth of evidence of their existence, all the more strongly since the homogeneous archaeological material points to one and the same population having inhabited all the dwelling sites within this area. Whether such was the case during the same period of time, or during successive periods, cannot be determined from the finds that have been made. If the archaeological sites were inhabited during successive periods, settlement on the different sites must have been of relatively brief duration, or else the culture must have remained relatively unchanged through the ages. The archaeological finds from the different sites are on the whole of a uniform character.

La Candelaria first became known as an archaeological site through some objects sent in to Professor A. MÉTRAUX, then head of the Ethnographical Museum of the University of Tucuman by Mr. CÉSAR SENEZ, Tucuman. These finds gave rise to an initial expedition in 1930 to La Candelaria. Of this expedition, in which also Professor R. SCHREITER of the same university took part, Professor MÉTRAUX has



Fig. 5. Landscape, near Pantanillo.

published a brief account (MÉTRAUX, 3). The material collected in this somewhat cursory research has been briefly described by the present author in the transactions of the XXV International Congress of Americanists in La Plata (RYDÉN, 1). The La Candelarian material dealt with in this paper has already been published in more popular form in a travel account (RYDÉN, 3.) In connection with his subsequent botanical researches in La Candelaria, Professor SCHREITER has continued his studies of the archaeology of that district. The results of these studies are published in a minor report (SCHREITER, 1). Partly on the basis of the present author's researches, MÉTRAUX (4) has dealt with the relation of the La Candelaria finds to the distribution of the Arawak and Tupi-Guarani tribes in South America in an essay embodied in the transactions of the above-mentioned Congress.

Owing to the slenderness of the funds at my disposal for researches in La Candelaria, I had to confine my work within

narrow limits. In the choice between examining as thoroughly as possible a single site or of examining more superficially a number of sites, I decided in favour of the latter alternative. In examining only one or two sites one could not always be certain to obtain a result that gave an adequate return for the work, and for that reason a less exhaustive examination of a large number of sites seemed preferable. To this may be added that this plan resulted in a wider archaeological survey of La Candelaria as a whole. A further, and perhaps decisive, reason for my method of working was that I consider it more fitting that exhaustive researches should be left in the hands of local archaeologists. The Argentine scientists, when working up the finds, also have access to original comparative material from other areas in their country. Access to originals constitutes an advantage which can only be fully appreciated by the student who has to rely exclusively upon the more or less perfect illustrations found in the literature. When I had finished my examination of a site I did my best, whenever possible, to restore its original appearance with a view to facilitating the work of those of my Argentine colleagues as at some future time may have the opportunity of carrying out a thorough examination of the various archaeological sites in La Candelaria. They will be sure to reap a rich reward from their work.

II.

A description of certain archaeological sites in La Candelaria, and of the research work carried out.

In the following will be described, one by one, the different archaeological sites examined by me in La Candelaria, and an account given of the result of these researches. I shall, however, confine myself to describing the locality of each site, the excavated funerary urns and the presence of immovable relics, such as «morteritos», stone-built structures, and so on. Movable finds discovered in the excavations, such as pottery fragments, stone or bone objects, etc., will on the other hand be dealt with under separate headings. This method of treatment is due to the fact that the archaeological material recovered from the various localities is on the whole of the same general character. In this connection I shall also refer again to a number of finds from La Candelaria already known through the works mentioned above. Certain objects, e. g. funerary urns, acquired by me as gifts or by purchase, will be dealt with in connection with the description of the sites where they were found.

On the map, fig. 6, all the archaeological sites visited by me are shown. As not a single one of the maps of La Candelaria known to me gives even a fairly accurate representation of the country I have had to content myself with a sketch map. This has been compiled on the basis of the very indifferent official maps of the district available, modified from the sketch map accompanying Professor SCHREITER's paper (I, p. 55) and my own observations. Such map details as are found in the following accompanying the descriptions of

sites cannot claim to be accurate, as they are nothing but hurried sketches made on the spot and only published with a view to making clear the description of the site. In cases where a given locality is not found on the map, the finds originating from it have come into my possession as gifts or by purchase, and I have had no opportunity of visiting the sites in question. Where the locality of a find is only given as La Candelaria this does not refer to the chief place of the department but denotes that the object originates from some unspecified locality within the department.

In the foregoing I have already pointed out the effect produced by the annual summer rains, on the ground level of the archaeological sites, and I shall here mention some further characteristic features common to ancient dwelling sites in La Candelaria.

The sites are easy to find on account of the multitude of pottery fragments that are seen scattered over the area of the ancient settlement as well as in its immediate vicinity, where they have been carried by rain water. In these sites, on which forest vegetation is sparsely growing, in addition to pottery fragments, there are also found grinding stones, i. e. slabs used as underlay in grinding Indian corn, mullers appertaining to such slabs, mortars, pestles and axes of the same material, etc. Finds of this character show that a place has been inhabited for a considerable length of time. Thanks to the numerous movable finds still being made within certain areas in spite of the effect of the transporting action of the rainwater, it is possible to determine, with a very high degree of probability, the locality and extent of the settlements. Within an area determined in this way, funerary urns are almost without exception found buried in the ground. Only in a very few cases have I come upon clay vessels, used as funerary urns, without at the same time having found evidence of long-continued occupation of the site. It is, however, difficult to determine whether a clay vessel sunk in the ground actually is a funerary urn. In most cases the

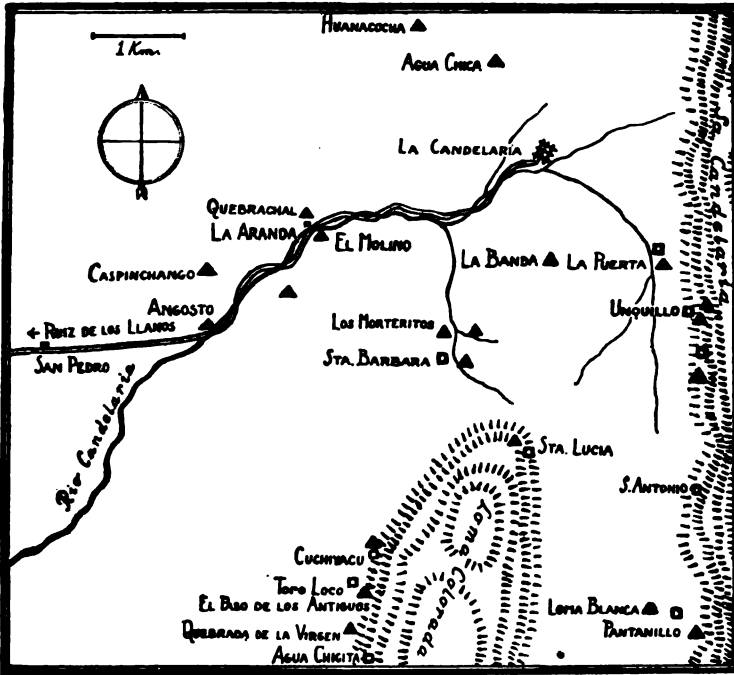


Fig. 6. Sketch map of the region explored in La Candelaria. □: present-day habitations, ▲: archaeological ground.

bones have entirely vanished by disintegration, and then one has to rely on the form of the vessel. In cases where skeletal remains were found it was evident that the dead body had been interred without any preceding cremation or skeletonization. The ancient mode of burial in La Candelaria must therefore be described as *direct urn-burial in the ground on the dwelling site*. The movable finds as a rule occur quite close to the surface. The wash of the rains, by carrying away the layer of earth that may have covered fragments more deeply situated, has contributed to their superficial accumulation. No culture strata of different character were to be observed, not even in low-lying dwelling sites that were hidden underneath a protective covering of soil.

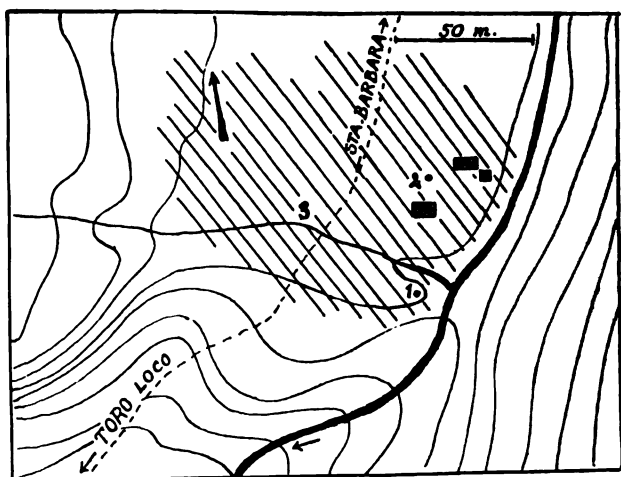


Fig. 7. Sketch map of the Cuchiyaco site, La Candelaria. The shaded area marks the approximate area of the ancient Indian settlement. The squares denote modern houses.

Cuchiyaco.

This locality^{*} is situated immediately at the foot of the western slope of Loma Colorada. Its name is of Quichua origin and, according to LAFONE QUEVEDO (4, p. 87), means »agua del chanco» (yacu = water; cuchi = of the peccary). It is, however, not very probable that the influence from the plateau region of which the Quichua place names in La Candelaria bear evidence dates from the pre-Columbian era. All authorities, of early as well as later dates, agree upon the point that the Incas never succeeded in extending their dominion over the plains west of the Andes, i. e. the present day provinces of Tucuman, Santiago del Estero, and Cordoba. Incan influence never went beyond the area now covered by the provinces of Jujuy, Salta, Catamarca, La Rioja, San Juan, and Mendoza. LEVILLIER (1, p. 35 and foll.) is on this account of the opinion that when in our days relics of the Quichua language are met with in the provinces of Santiago and Cordoba, these relics are not ascribable to Incan



Fig. 8. View of Cuchiyaco from the north. Between the tree in the centre and the house in the background was excavated the clay vessel seen in fig. 11. In the right foreground is seen a modern bread-oven. To the left is the slope of Loma Colorada.

influence but to the fact that the language was implanted there in the course of the Spanish missionaries' activities.

From the extent of the surface finds it appears that the Indian settlement was located on the spot where the present inhabitants have erected a small number of simple dwelling houses (sketch map, fig. 7). East of the ancient site Loma Colorada towers to an imposing height. Immediately at the foot of the slope there runs a stream which forms the eastern limit of the site. In the west is an extent of flat ground, almost entirely bare of vegetation, rising gently towards the hill that bounds the dwelling site in the west (fig. 8). The western face of this hill slopes steeply down to the plain that stretches away to the Rio Tala. In the north the area is bounded by dense forests, and in the south by a sharp decline down which runs the road to Toro Loco. This sloping ground, together with Loma Colorada's steep rise in the east, may be supposed to have provided the



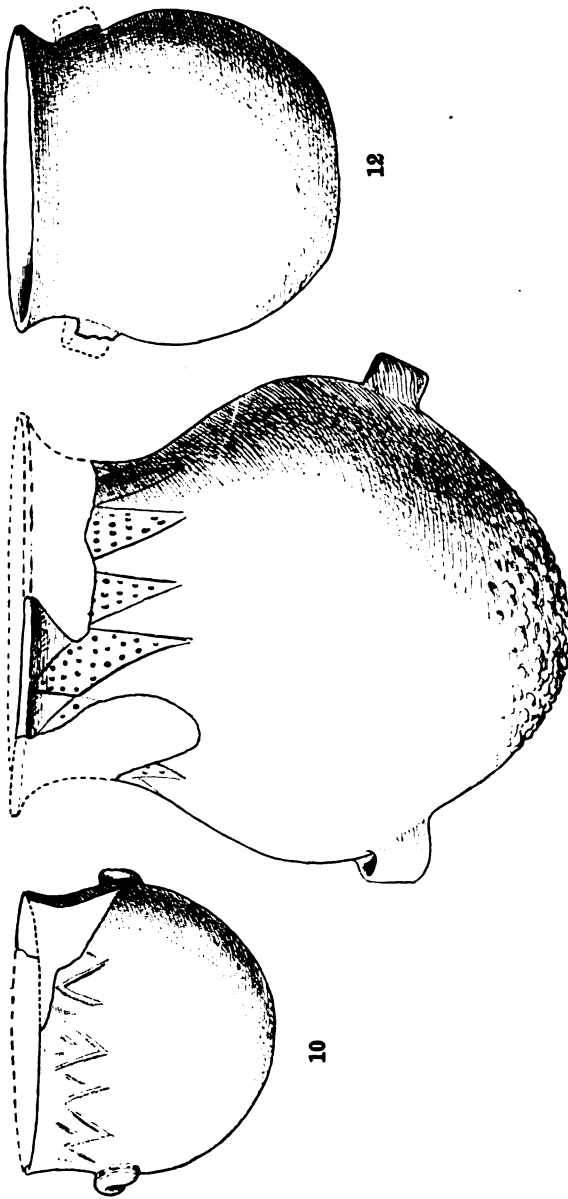
Fig. 9. The small gully with the subsided grinding stones at Cuchiyaco, as seen from the east.

inhabitants of the ancient site with a certain measure of security from surprise attacks from those directions. The western slope, on the other hand, may have been too distant to afford any such protection.

Running right across the site from east to west is a small, dried-up gully, which probably carries water only in the rainy season. On the sketch map in fig. 7 it is marked with the figure 3. This gully leads down to the small stream that forms the eastern boundary of the site. At the time of my visit, which took place during the drier part of the year, the stream was running with water, a circumstance which may give an indication of the probable supply of water in the old settlement. In the smaller, and dry ravine a number of large stones had slid down (fig. 9). At least four of them had once served as grinding slabs for maize, seeing that one face of each had been worn flat.

Grave 1.

Two funerary urns were also discovered. One of these, found at the spot marked with the figure 1 on the map, was



11

Fig. 10—12. Three clay vessels from Cuchiyaco, of which the one on the left was found inside of a sepulchral urn. The largest of the vessels is a sepulchral urn for a child. (G. M. 33.15. 707—709).

much damaged owing to its situation in sloping ground where it had been much exposed to the wash of rain-water. Thus only the bottom of it remained in situ, the upper portion having been entirely broken off by the rain-water. The preserved portion of this urn is of the same shape as the lower portion of the urn seen in fig. 70. In certain cases, to which I shall recur later, a hole is found to have been knocked out of the urn bottom. The urn just referred to was, however, intact in this respect. The diameter of the portion discovered in its original situation was 90 cm., and its height 50 cm. No fragments were found, either inside or near the urn, to indicate that it once had a lid. At the beginning of the excavation, the broken-off edge of the vessel appeared as a circle in the ground surface, and the whole of the interior was filled with soil of a consistence identical with that surrounding it. No remains of bones were found, nor any fragments of the portion of the urn that had been washed away. In the rounded bottom portion were however discovered a number of pottery fragments lying close together, which even a cursory examination revealed as belonging to some vessel other than the funerary urn itself. In the latter, the material at the line of fracture was of a brownish colour, while on the outer sides it was more reddish. The outside was however for the most part covered with a thin and greyish, calcareous coating due to action by some salts contained in the surrounding earth. In the surface of the fracture it was possible to observe with the naked eye that the clay had been mixed with a of powder consisting of pulverized, stratified rock of some kind. This was evident from some of the coarser particles. As mentioned in the opening chapter, La Candelaria lies on the border-line between the highland in the west and the Chaco in the east. In the stoneless Chaco the Indians mix their pottery clay with crushed potsherds, while in the highlands they practically always use sand, mica, etc. In La Candelaria the added ingredient in the ware, as has just been mentioned,

consists of pounded, stratified rock. It also appears to contain a high percentage of mica, and thus La Candelarian pottery, as regards the process of its manufacture, most nearly approaches the highland ceramics (LINNÉ, 2, p. 29 and foll.). The walls of the urn were about 7 mm. thick. The sherds found in the rounded bottom portion of the urn consisted of a different material. In colour this was more blackish grey, and the surfaces showed a finer polish. They seemed to have been given an outer coating of fine-washed clay, applied after the final shaping of the vessel. This is what LINNÉ (2, p. 141 and foll.) calls the "slip method". The idea of the slip-method originates from Central America (LINNÉ, 2, p. 174) and, according to the map he publishes, it occurs in South America in the Andine highland, along the north-eastern coast down to the mouth of the Amazon river and the regions inland, as well as in the extreme south of Brazil and in the region around the mouth of the Plata River. In La Candelaria, the slip method would appear to have constituted an influence from the highland. The outer side of the sepulchral urn was no doubt also slip-finished. The fragments thus found within the funerary urn must originate from a vessel deposited there as a gift to the dead, and it may possibly have contained food of some kind, or water. In reassembling it, it was found to be far from complete. Little more than half of it remains, but its partial restoration nevertheless gives a fairly good idea of its original appearance (fig. 10). It measures 24 cm. across the mouth. The bottom is missing, but was probably flat. On the outside of the vessel, in its widest part, two semicircular earthenware ridges are placed opposite each other on either side of the vessel, with their rounded sides upwards. These projections serve as handles, and are in the following referred to as *crescent-shaped ridge handles*. The incurving wall of the vessel above the handles is provided with an ornament which in the following we shall find on nearly all the funerary urns, namely an incised zig-

zag line. In this case the line is single, but in the open, triangular fields between the zigzag line and the rim of the mouth a couple of irregularly placed lines are incised. The material has a thickness of one decimetre while the decorating lines are shallow, for which reason they do not appear very distinctly.

Grave 2.

A second funerary urn was also found here (fig. 11) in the spot marked 2, on the map, the spot being shown on fig. 8. It was badly damaged. Of the rim of its mouth only one fragment was found, from the earth filling the interior of the urn. The line where the urn had been broken off level with the neck appeared at the beginning of the examination as an incomplete circle in the ground surface. Nothing else was found inside the urn beyond the above-mentioned rim fragment, thanks to which, however, it was possible to reconstruct the original appearance of the vessel. As will be apparent from the illustration, its neck is ornamented with two incised zigzag lines crossing each other. The rhombic fields that have thereby been formed are filled with dots. Where not hidden underneath a calcareous coating, deposited during the time of its being embedded in the soil, the surface of the material is reddish brown. Its thickness is about one centimetre. The outside of the vessel is smooth and apparently given a slip coating. An exception to this is the bottom portion, which is remarkably rugged in consequence of the vessel having been primarily used as a cooking pot, although provided with handles.

The ground surface of the site was apparently at a considerably higher level at the time when it was inhabited. This may be inferred from the present shallow position of the funerary urn in the soil. On the basis of the positions and sizes of the urns, the thickness of the earth-layer washed away by

the rain-water may be estimated at one metre at the lowest, at all events at the edge of the eastern stream. In this ravined rivulet were in fact recovered large numbers of pottery fragments and stone objects that had been washed down from the more elevated dwelling site, but finds of this description can also be made here and there in the open ground surrounding the present dwelling houses. These latter finds were all very superficially disposed.

Another clay vessel from Cuchiyaco is seen in fig. 12. It had been discovered and dug up by the local inhabitants, and was acquired by me through purchase. Nothing else of an archaeological character had been found with it. Its surface is blackish grey and has been given a coating of slip. Remains of two handles are discernible just below the edge of the rim of the mouth. It has a flat bottom, and the diameter of the mouth is 27 cm. The material is about 8 mm. thick.

El Paso de los Antiguos (Toro Loco).

A southerly course from Cuchiyaco down the slope of Loma Colorada takes one after a kilometre's walk or so to another puesto (farm), called Toro Loco. It lies at a slightly lower level than Cuchiyaco. Past Toro Loco runs a small stream whose source lies towards the south in the neighbourhood of Agua Chicita. If one follows this stream upwards for about one kilometre and then, at a point where a smaller affluent enters from the left, turns to the left — towards the north-east — about 200 m. farther on one enters a small valley with rather steep sides both in the west, north and east. At the time of my visit the main stream was running with water. At the highest point of the northern rise is situated an ancient Indian dwelling site known as El Paso de los Antiguos, (cf. map sketch, fig. 13). Its situation much resembles that of Cuchiyaco. The steep rise of Loma Colorada forms its protection in the east, while in the south there is the rather steep slope, above referred to, down to the stream. From

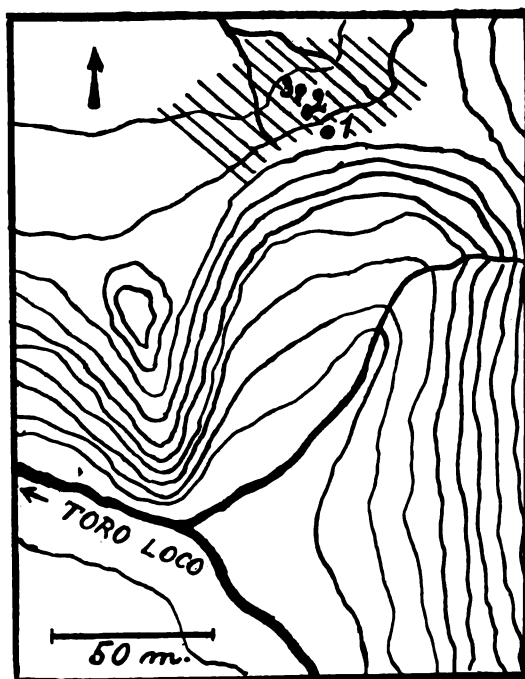


Fig. 13. Sketch map of the archaeological site El Paso de los Antiguos (Toro Loco), La Candelaria.

the north and the west, on the other hand, the site lies open. Even in the west there is, however, a sharp decline, but this is some distance away. In the north the ground is level and covered with dense forest, and the dwelling site proper is in our days also forest-grown. The finds are limited to the area next to the steep southern declivity. Two small gullies, which only after heavy rains would be likely to carry water to a minor extent, have however been sufficient to damage irretrievably the northern section of the dwelling site.

Grave 1. Cf. map sketch, fig. 13, where its position is marked with the figure 1.

This grave was situated at the highest point of the ridge where the settlement stood. In consequence of this position

the rain-water had washed away everything except the bottom portion of the urn. Inside this were found some remains of human bones, but these were in such a state of decay as to make their preservation impossible. In the soil contained in the urn there were, besides the bone remains, also a number of fragments of the urn itself, and others were scattered about in its immediate neighbourhood. Even a cursory inspection being sufficient to show that too much of the urn was missing to make its reconstruction possible, it was rejected. It was however of a certain value in so far as it proved, in conjunction with the finds mentioned below, that the ground level at the time the burial was effected was at least 1 m. higher than it is now, since judging from the shape of its bottom, in its original state the urn must have been at least one metre in height. Its material corresponded to that of the urns to be described below.

Grave 2. (Fig. 14). The position of this grave is marked 2 on the map sketch.

Of this funerary urn and its lid only about one-half was preserved in situ. Its position as it then was is seen in the figure. Its original shape cannot be determined, as only the lower portion, to a height of 95 cm., was found to be reconstructible. A few fragments of the rim were recovered, it is true, but it has not been possible to establish their coordination with the portion recovered in situ. The urn may however be supposed to have had the shape seen in fig. 14, *b*. The rim fragments that were found are provided with four parallel zigzag lines arranged as in the urn shown in fig. 70, although closer together and more deeply impressed. Two handles which no doubt had belonged to the urn were, along with a number of other fragments of the urn and the lid, discovered in the soil with which its interior was filled. The material of the portion found in situ is in the upper part 5 mm. thick, but its thickness increases towards the bottom, where it amounts to about 10 mm. As always, the rim of the

mouth has been made especially massive, being here about 15 mm. thick. The zigzag lines ornamenting the neck of the vessel on the outside appear in the form of ridges on the inner side, owing to the thinness of the wall of the vessel. In the fracture surfaces the material is brown in colour, while the surface otherwise are of a greyish, brown-red tint, from a calcareous film having become deposited on its outer sides while the vessel has been embedded in the soil. In the fracture surfaces of the fragments it is possible to discern small stone particles, showing that the clay has been mixed with some sort of stratified rock, reduced to a powder.

In this fragmentary vessel one finds for the first time the peculiarity of a hole having been purposely knocked out in the bottom of a funerary urn. This custom of "killing" a clay vessel deposited as grave furniture is known both from North, Central and South America (NORDENSKIÖLD, II, p. 22). NORDENSKIÖLD (II, p. 22) discovered two vessels, "killed" in this way, in "chullpa" graves on the border between Bolivia and Peru. He also mentions that the Quichua Indians burn the deceased's belongings on the eighth day after his death, and that on that occasion they render the clay vessels useless in the way here described. A ceremonial place of this kind is illustrated by NORDENSKIÖLD (I3, p. 86) in another connection. In the earlier of the two archaeological strata examined by him in Mound Velarde in Mojos, NORDENSKIÖLD (I) discovered a portion of the bottom of a vessel with a hole knocked through it (R. M. T. 8091).¹⁾ AMBROSETTI (4, p. 43, 47) has observed this custom of "killing" clay vessels among finds from Pampa Grande, in the Province of Salta. It should however be pointed out that AMBROSETTI (4, fig. 36) is in error when he also classes such holes as have been made for mending cracks on the clay vessels as »agujeros de muerte». The finds from Pampa

¹⁾ "R. M." denotes that the object belongs to the Ethnographical Museum of Sweden, Stockholm, and the additional letter and number refer to the Museum catalogue.

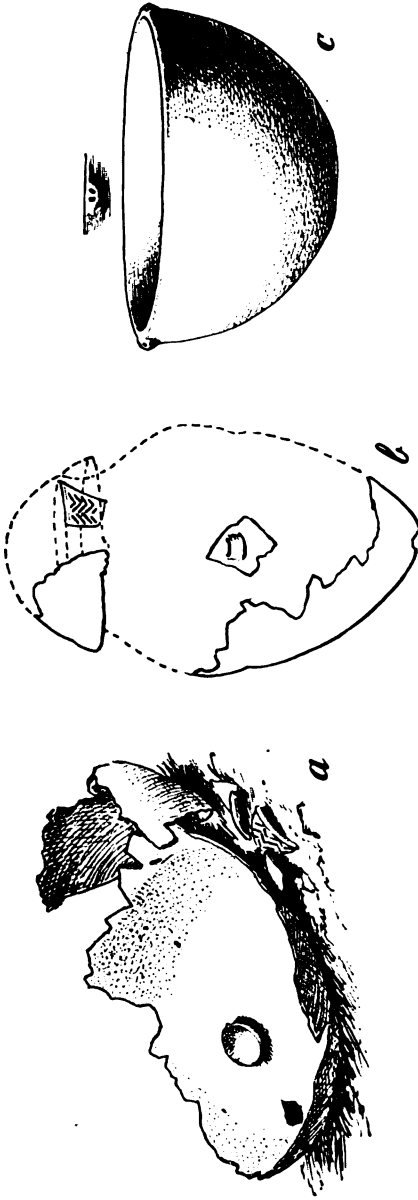


Fig. 14. A much damaged sepulchral urn with lid, and a small bowl found inside the urn. El Paso de los Antiguos (Toro Loco), La Candelaria. (G. M. 33.15. 736).

Grande are those most closely corresponding to the ones here dealt with. Ambrosetti quotes TEN KATE as having observed the custom among pottery from the Calchaqui valley, and DEBENEDETTI (3, fig. 115) mentions a child's funerary urn from Pachinco, in San Juan, with a hole knocked through its bottom. A relic of the ancient Quichua Indian custom of destroying all personal effects left by the deceased still survives in the Calchaqui valley in that occasionally all the wearing apparel of a deceased person is burnt after the funeral (AMBROSETTI, 7, p. 163). To a sepulchral urn from the Paraguayan Chaco, with a hole knocked(?) through its bottom (SCHMIDT, 3, p. 91), I shall recur below. In a similar way, among the sepulchral vessels that are depicted by GOELDI (pl. II, 15 b and 18 b) from Brazilian Guiana, two are holed through the bottom, one of them having six holes, the other three. These holes were however probably purposely made in the process of manufacture, which is presumable also the case with the hole in the bottom of the urn just referred to, from the Paraguayan Chaco.

Another method of »killing» a clay vessel, or a calabash, was by simply smashing it to pieces (LINNÉ, 1, p. 196) but on this point I am not in possession of any authentic evidences from La Candelaria. AMBROSETTI (4, p. 139) considers that the abundance of pottery fragments, evidently originating from unused vessels, that have been discovered as surface finds in association with sepulchral urns in Pampa Grande indicates a ceremonial breaking up of clay vessels. He connects this vessel-breaking with some ceremony of a rain-making character, and cites, in support of this theory, the Sumac ñusta song, published by GARCILASSO DE LA VEGA (vol. I, p. 197), in which is mentioned a similar Incan ceremony. Ambrosetti is of opinion that the holes by which the clay vessels were »killed» were connected with some rainmaking rite of this character. I have, however, already pointed out the error into which Ambrosetti has fallen when he puts down holes that have come into being in connection

with the mending of a crack in the vessel as being «agujeros de muerte». Instead, the holes in question prove that the vessels were designed for everyday use, and the fragments found in the burial sites point to the ground also having been dwelt on. In this connection attention may also be drawn to the fact that it has been maintained that the large number of sepulchral urns containing skeletons of children, which have been found in the Diaguita region, constituted some sort of sacrifice in the invocation for rain (AMBROSETTI, 4, p. 37). As regards childrens' sepulchral urns from La Candelaria, it may be noted that their numbers very palpably exceed such urns as, judging by their size and skeletal remains, were designed for the interment of adult persons. It may, however, be pointed out that in our days infant mortality in La Candelaria amounts to 40 % (MÉTRAUX, 4, p. 185).

Not all the funerary urns of La Candelaria have, however, been "killed". It has been maintained (NORDENSKIÖLD, II, p. 22; KARSTEN, I, pp. 240—243) that the underlying idea when "killing" a vessel in this way was to liberate its "soul" in order that the deceased should be able to make use of the vessel also in the next world, where he is believed to continue his existence on about the same lines as during his life on earth. Vessels that have been "killed" would therefore be such as have been in daily use. When in La Candelaria we find "killed" funerary urns, it may of course be drawn into question whether the explanation given above be correct, seeing that it does not appear very probable that the Indians believed that in the next world the deceased would have need of his funerary urn a second time. When an urn has been "killed" from the above-mentioned motive there is much justification for supposing that its primary use was for some practical purpose or other, and that there was an idea that in the next world it would continue in a similar employment. A circumstance arguing against these large earthenware vessels having been manufactured exclusively for the

purpose of being used as funerary urns is that cracks found on them have been carefully mended by a method which will be described in the following (p. 59). What practical purpose these large funerary urns originally served is, on the other hand, more difficult to determine. Possibly they were used for storing maize, or they may have served as capacious water containers during the dry season. To this day the inhabitants of the Calchaqui valley keep maize and other grain in large earthenware containers in order to preserve these stores against damp and animals. This method probably constitutes an inheritance from the purely Indian population of the valley in question (AMBROSETTI, 4, p. 53). In the case of the very largest sepulchral urns from Pampa Grande Ambrosetti considers that the walls of these vessels are too thin for resisting the pressure of water from within. In view of the thinness and porousness of the ware it is in fact unlikely that they could contain water for any considerable length of time.

I mentioned that the urn in question was provided with a lid, about one-half of which was preserved in situ. The material of this lid, and also its surface-dressing, differs from that of the urn itself, and this lack of correspondence between urns and their lids will in the following appear in several other finds. In this case, as always, the material of the lid is thicker than that of the urn. The lid itself is about one centimetre thick, and is a millimetre or two thicker in its rim. The outside of the urn is frequently carefully finished with slip. The lids, on the other hand, nearly always present a different kind of surface treatment. The inner side of the lid is smooth and even, probably slip-treated, while on the other hand the outer side is striated, i. e. scored with narrow and shallow, parallel grooves. These grooved lines are disposed in broad parallel bands, making it apparent that the striation has been effected by means of some comb-like instrument (fig. 15, *a*). Similar striation on the outer sides of clay vessels has already been observed by various

students. BOMAN (I, vol. I, p. 241, pl. XIII a, d; 6, pl. XV d) thus mentions earthenware vessels from La Paya and Tinti, with the surface treated in this way. SCHREITER (2, p. 6) refers to certain "huirquis" from the Calchaqui valley with the surface similarly treated, and both these scientists suppose the striation to have been effected with the help of some implement not unlike a comb. NORDENSKIÖLD (II, p. 11) mentions that the clay vessels found at Casabindo, in Puna de Jujuy, apparently have been polished with stones or leather (cloth). Clay vessels found south of Puna de Jujuy, in Quebrada del Toro and in the Salta valley, are frequently smoothed with leather or stone, but in these localities are also found vessels surface-treated with some comb-like instrument leaving traces in the form of parallel grooves. Impressions of this kind are, however, never seen on vessels from Casabindo. This circumstance proves, according to Nordenskiöld, that no trade in clay vessels existed from Quebrada del Toro to Casabindo, although here must have run an important trade route. A trade in clay vessels in the opposite direction Nordenskiöld however does not think entirely inconceivable, and that it is possible that the stone-smoothed clay vessel that have been found, e. g., at Ojo de Agua, in Quebrada del Toro, thus were manufactured in Puna de Jujuy. This is because Nordenskiöld considers it out of the question that one and same people would have manufactured both stone-smoothed and "comb"-striated clay vessels, especially in view of the fact that the former are considerably more artistically shaped than the latter. Both these clay-vessel types must, however, have been contemporaneous, for Nordenskiöld mentions that ERIC VON ROSEN found both of them in one and the same grave at Ojo de Agua. In La Candelaria, however, both methods would appear to be of local origin, and contemporaneous. On a later expedition Nordenskiöld happened to find out by what sort of instrument the striation in question is produced. NORDENSKIÖLD (8, p. 137) noticed that the Chiriguano and Chané Indians gave their clay vessels a final

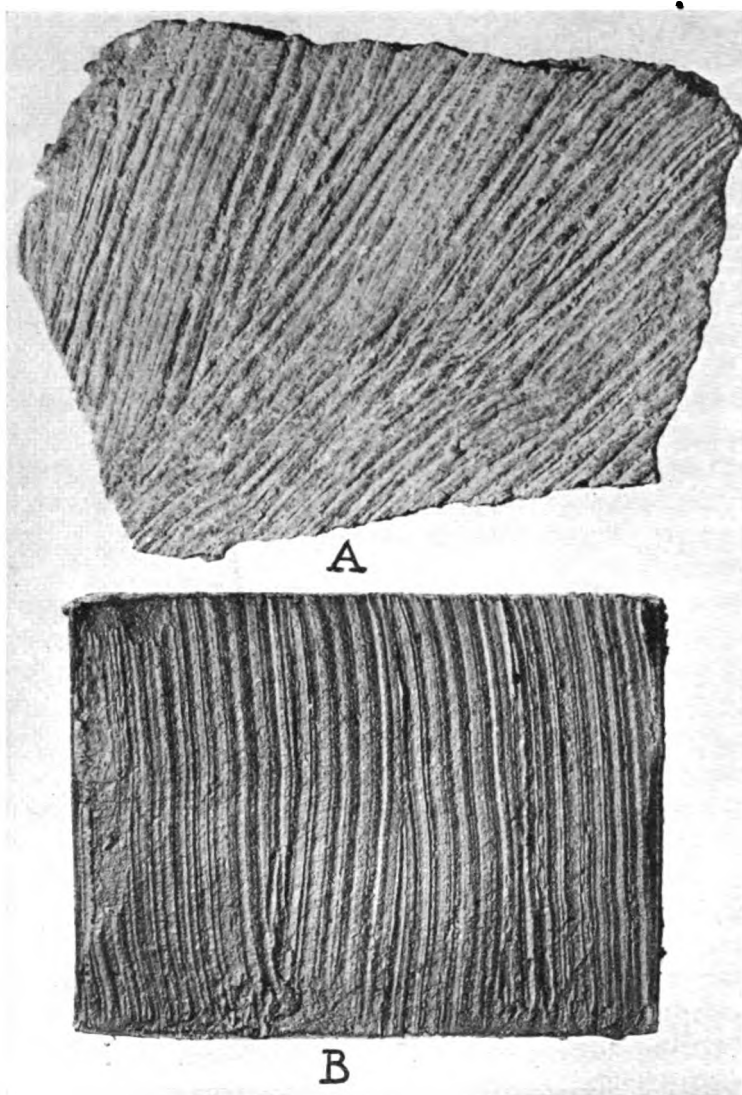


Fig. 15. At the top a fragment of a sepulchral urn lid from Caspinchango, La Candelaria. Striation evidently produced by means of a shelled maize cob. The lower picture shows the surface of a plastic substance after treatment with a shelled maize cob that was used by Ashluslay Indians for polishing the sides of clay vessels in the course of manufacture. (G. M. 33. 15. 751, a-b).

rubbing over with a shelled maize cob, especially in the case of vessels of a coarser quality, and that such rubbing resulted in the characteristic marks here referred to. Also in Nordenskiöld's collection from the Guarayos Indians a shelled maize cob (R. M. G. 34), is found, which has been employed in a similar way. Nordenskiöld is of the opinion that polishing with a maize cob is an element of the ceramic art of the mountain Indians. The most easterly evidence in Chaco of this method of treating the surfaces of clay vessels is from the Chamacoco Indians (BALDUS, p. 46). The above described method of finishing the surface of clay vessels still obtains in Argentina among the mestizos of the highlands in the Province of Cordoba (APARICIO, 6, p. 190, pl. VII). In a collection of implements for pottery-making acquired by Nordenskiöld among the Choroti Indians is also included a shelled maize cob (G. M. 13. 1. 121)¹⁾ which had been used in polishing clay vessels. With the implement in question the author has treated a soft substance of about the same consistence as soft clay. The marks that then resulted show exact correspondence to those present on the La Candelaria finds. Fig. 15 *a* shows a fragment of a lid striated as above referred to, while *b* in the same figure shows the marks produced with the maize cob. As will be seen, the resemblance is perfect. This experiment also goes to prove that maize was cultivated by the ancient Indians of La Candelaria, while the large number of grinding stones for maize, collected in the archaeological sites, to which I shall recur below, prove the fundamental importance of this maize cultivation in the economy of the Indians. The Palikur Indians of Brazilian Guiana, in polishing their clay vessels before firing them, used a scraper consisting of gourd shell (G. M. 26. 3. 2). The edge used for polishing is toothed, and this makes it possible to scrape off the clay more effectively than with a straight-edged implement. The maize cob also has the same advantages. The lid belonging to the urn here dealt with was

¹⁾ "G. M." = in the Gothenburg Museum collections.

probably provided with two large rim bosses — bulging projections at the edge of the mouth — like the lid of the funerary urn in fig. 43, but only half of one of them was discovered.

The interior of the urn was filled with soil in which were found fragments of the urn and the lid, as well as a number of skeletal remains. The latter, however, were in an exceedingly poor state of preservation. Only a few fragments of them could be collected, and three skulls which were discovered quite near the ground surface crumbled after a few minutes' exposure to the open air into a heap of bone dust. Whether all three had belonged to individuals buried in the urn is uncertain. Judging from their positions it seemed probable that two of them had been washed there by rain-water. Evidence is however available that in La Candelaria *several* bodies have been found buried in the *same* urn (SCHREITER, 1, fig. 2). Dr. C. O. FORSELIUS, of the Sahlgrenska Sjukhuset, Gothenburg, has examined the recovered, very scanty, skeletal remains and found that they consist of some skull fragments, portions of a pelvis, and a few worn teeth, one of which had been affected by caries. All these remains belonged to an adult individual.

Nearer the bottom of the urn was discovered the bowl illustrated in fig. 14, c. It was found broken up into several pieces by pressure from overlying soil, but the fragments were left in their interrelated positions so that already in the course of excavation it was possible to observe its shape. The diameter of the bowl is 14 cm., and the material is 4 mm. thick. The material of the bowl is of a finer quality than that of the urn itself. Its entire surface is covered with a light-brown coating, deposited from lengthy contact with the soil. Immediately below the edge of the rim there are, as will be seen from the figure, two small projections, placed opposite each other on the outer side of the bowl. As is shown from the detail figure, they are ornamented with two small, incised lines. If one may judge from its position, this bowl was placed within the urn as a funerary offering. In it were

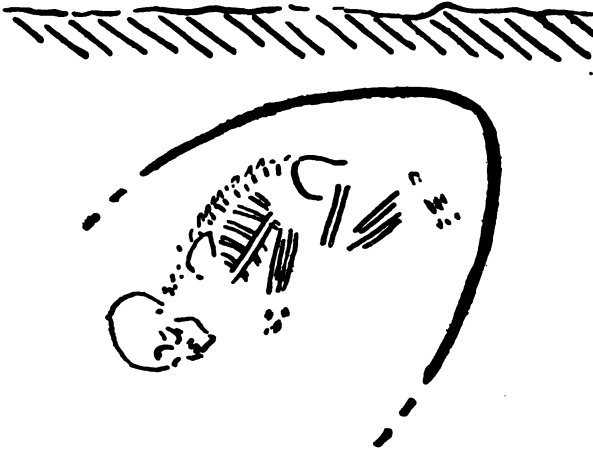


Fig. 16. Vertical section of grave 3. El Paso de los Antiguos (Toro Loco), La Candelaria.

found some fragments of a human cervical vertebra, and therefore probably forming part of the remains of the individual buried in the urn.

Grave 3. (Fig. 16).

The position of this grave is on the map sketch marked by the figure 3. Even this funerary urn has suffered considerable damage from rain water. There was left of it only its ovoid bottom portion. This had almost been turned upside down by the wash of the rain-water, so that the mouth of the vessel was turned downwards. The material of the discovered portion resembled that of the urn just described, but there was no hole knocked through its bottom. Owing to its bad state of preservation this urn was rejected. Examination of the embedding soil revealed skeletal remains of the body that had been buried in the urn. These remains were, it is true, very much decayed, but from their position it was, however, possible to make out that the deceased had been buried with his knees drawn up towards his chin. On

the whole it would seem that the upper portion of the urn had first been washed away, and later, when part of the surrounding soil had also been carried off, the bottom portion of the urn had turned over and assumed the position described above. The soil within the urn, however, maintained the skeleton in its original position. Professor J. VILH. HULTKRANTZ has subjected the preserved skeletal remains (G. M. 33.15.735) to an examination, the results of which are given in appendix I, find G.M. 33.15.735.

Quebrada de la Virgen.

In the ravine of the rivulet, mentioned in the foregoing, which, originating from Toro Loco, runs past the site of El Paso de los Antiguos, a bridle path takes the traveller in a southerly direction. This bridle path skirts the foot of Loma Colorada, and connects Toro Loco with the puesto Agua Chica, 3 kilometres farther south. About half-way between these two places, and just after passing an abandoned puesto known as Agua Chica, the path crosses a small stream and, after a minor rise, continues along the top of a low ridge which on one side is bordered by the stream just referred to, and on the other side by an affluent to it (cf. sketch map in fig. 17, and fig. 18). This place is known as Quebrada de la Virgen. Farthest to the northwest, at the extreme end of this ridge, traces of habitation are discernible. The spur of the ridge projects like a promontory in the angle between the two watercourses, and the site has certain strategic advantages. The ridge, it is true, only rises to a height of 7 to 8 metres above its encompassing watercourses, but on the other hand the incline down to the streams is in parts so steep as to be climbed only with difficulty. It is only from the south, and from the point in the north where the bridle path ascends the ridge, that the rise can be comfortably crossed over. The ridge, as well as its surroundings, is covered with trees and shrubs. Judging from conditions prevalent at the time of my visit, this dwelling site must in the dry season have

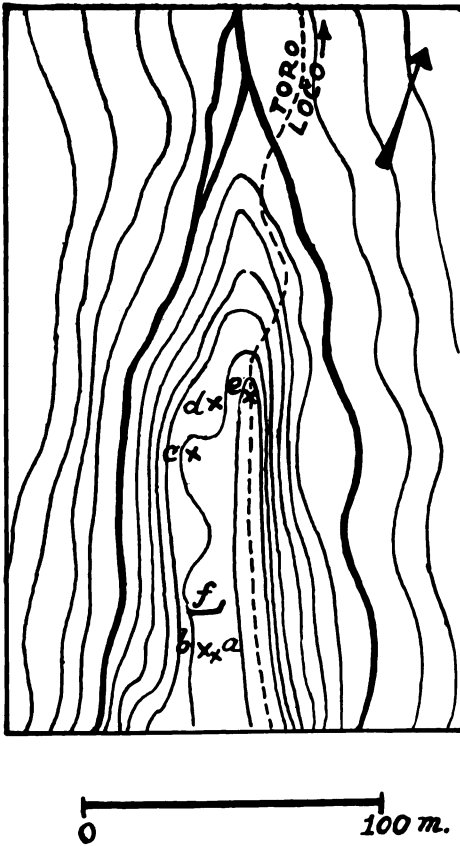


Fig. 17. Sketch map of the archaeological site Quebrada de la Virgen, La Candelaria.

been but poorly supplied with water. When I was there, in order to obtain water it was necessary to go about 300 m. down the ravine, and then the season was not exceptionally dry.

On the map seen in fig. 17 the different sites are marked by letters corresponding to the illustrations in fig. 19 denoted by the same letters. The letter *a* on the map denotes the locality where the object marked *a* in fig. 19 was discovered, and

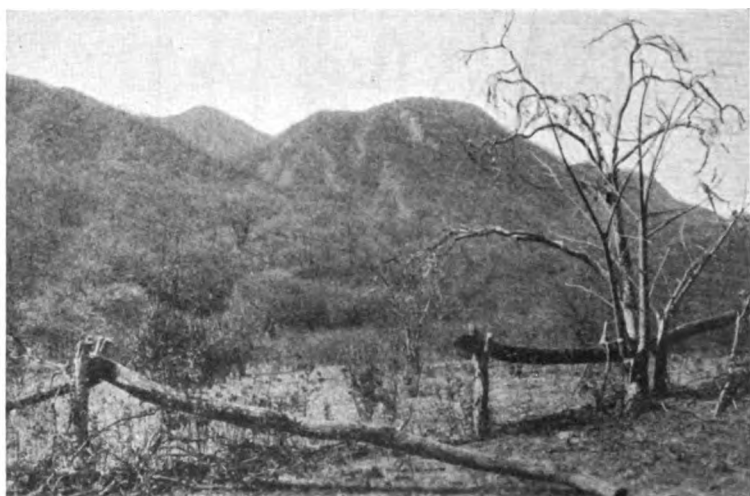


Fig. 18. Landscape near Quebrada de la Virgen, La Candelaria. At the foot of the mountain on the right lay the site of the ancient Indian settlement. The sepulchral urn in fig. 24 was found just outside the left edge of the area covered by the picture. The photo was taken from Agua Chica looking southwards.

so on. On the map, however, the letter *d* corresponds to fig. 20.

That the ridge was continuously occupied for a considerable space of time is evident from the number of grinding stones that still remain along its most elevated portion. Farthest in the south two such are found, fig. 19, *a* and *b*. One of these consisted of some sort of conglomerate rock, and in its grinding surface there projected above the rest of the mass the harder particles of the rock structure. In the north, on the extreme point of the ridge, close to the confluence of the watercourses, was found another grinding stone, fig. 19, *c*, together with a large block of stone with a cupular depression, fig. 20, its position being denoted on the map by the letter *d*. The upper face of this block was perfectly plane, horizontal, and in the centre of this surface was a circular, cup-shaped depression about 2 cm. deep, and measuring about 1 dm. in

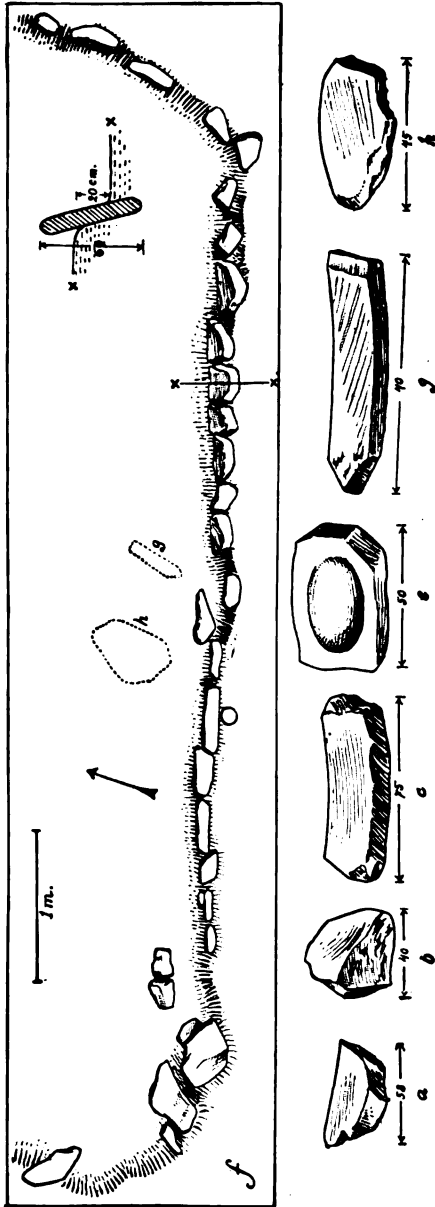


Fig. 19. Map of the stone construction at Quebrada de la Virgen and various stone objects discovered in this finding place.

diameter. This was evidently produced by pounding. The thickness of the block was about 30 cm., and the maximum extent of the plane surface 60 cm. The highest point of the northern portion of the ridge consisted of a mound containing stones, on the sketch map marked with the letter *e*. The mound was about 3 metres in diameter. This was examined, but with no other result than the finding of a large stone mortar about 50 by 30 cm. with one side hollowed out to a depth of 15 cm., this hollow running almost the whole length and width of the stone. To archaeological finds of this type I shall recur below.

The bent line marked *f* on the sketch map denotes a stone formation, the appearance of which is shown in detail in fig. 19, *f*, and figs. 21—23. Acted upon by the heavy rains, the upper parts of some of the stones had become displaced, but examination revealed that the bases of the upright stones formed a straight line. Only the westernmost stones — the section of the stone formation that had been most exposed to the rush of the water — were more irregularly arranged. The stones were set with their longitudinal axes vertical, and edge to edge with each other. No interspacial filling of smaller stones was found. Between the ground surface north of the long row of stones, and that south of it, there was a difference in level amounting to about 20 cm, and it could also be observed that the stones were leaning slightly towards the side of the higher ground level (cf. sectional diagram, fig. 19, *f*). The difference in level between the extreme western and eastern sections of the stone formation was 1 m. The first mentioned difference in level is probably the work of human hands, while the latter is due to the natural slope of the ground. Whether this stone formation had a greater extent in ancient times, and if so what it was then like, could not be determined from the examination described below.

On either side of and parallel to the line of stones a test shaft was sunk. The one sunk south of the stone formation



Fig. 20. Stone with a bowl-shaped depression. Quebrada de la Virgen.

yielded no return whatever. In the northern one, on the other hand, a few pottery fragments were found (G.M.33.15.636—650). One or two of them were striated in the same way as the lid described in the foregoing, one fragment was decorated with a few incised lines, and another was provided with a crescent-shaped ridge handle, resembling that seen in fig. 110, *d*, although smaller. The fragments are not very numerous, but nevertheless suffice for connecting the stone formation with the other archaeological finds here dealt with. In the same test shaft were also found two stones of a rock resembling sandstone, fig. 19, *g* and *h*, in each of which one face was worn quite smooth. One of these stones, *g*, if not both, had no doubt been used for sharpening the edges of stone axes. All of the detached finds just referred to were made at a depth not exceeding 30 cm., and in the case of the grinding stones, 20 cm. The position of the latter is marked on the map at 19, *f*, with a contour line of short dashes.



Fig. 21. Northern view of the stone construction at Quebrada de la Virgen, La Candelaria, before excavation.

Not a single one of these objects were found as deep down as the bottom edge of the stones forming part of the row. Other test shafts were sunk close to the stone formation, as well as at different spots on the ridge, but no result was obtained from any of them. After the above examination, the site was *restored* to its original state.

What purpose this stone structure once served is difficult to determine. The whetstones, grinding stones, and stone mortars that were discovered prove the site to have been occupied for a considerable length of time, and it is therefore probable that the stone formation once formed part of some building complex on the site. I am inclined to believe that the lower ground area on one side of the stone structure — within which the whetstones were found — once constituted the floor of a hut. The floor was at a lower level than the surrounding ground in order to gain more protection against the wind. This explanation as regards the type of hut in which the floor is sunk below the level of the ground has been advanced by NORDENSKIÖLD (12, p. 3) in connection with comparisons between Indian culture in southern South America and North America, respectively. In regard to the



Fig. 22. Eastern view of the stone construction at Quebrada de la Virgen, before excavation.

occurrence of the hut type in question in northwestern Argentina, Nordenskiöld bases his argument on information supplied by CABRERA (p. 141), according to which the Juries, or Tonocotes, possessed huts into which one entered as if stepping down into a cellar. Cabrera says that it was not only the cold winds but also lack of suitable building material that brought about the evolution of this type of hut. Huts of this type are also referred to in LITTERÆ ANNVÆ (p. 417). Thus we may perhaps here have before us evidence proving that the finds that are here published once belonged to the Tonocote Indians, a question to which I shall recur later. The object of the stones would have been that of furnishing support to the mud wall of the hut. Yet another similar stone structure is described from the archaeological site Pantanillo. (Loma Blanca).

At the site we are here dealing with, the only finds of pottery were the above-mentioned fragments recovered from the test shafts. No funerary urns were to be seen. Such an urn was, however, discovered only a few hundred metres from Quebrada de la Virgen. As already mentioned, there was an old and deserted puesto, called Agua Chica, a short



Fig. 23. The eastern section of the stone construction after the soil had been dug away down to the bottom edges of the blocks. On the right, two grinding stones discovered in the course of the excavation. View from the north.

distance north of Quebrada de la Virgen. When leaving the latter place, just before one reaches the puesto, there is on the left hand a piece of flat and open ground. This slopes down towards the ravine in which the path runs. This stream is identical with the one running past Quebrada de la Virgen. To the west this open ground is bounded by a hill. The plain is seen in fig. 18. The side of the hill sloping towards it is furrowed by ravines, and in one of these, about 200 m. southwest of the derelict puesto, was discovered a funerary urn, fig. 24. Unfortunately the rush of the water of the ravine in the rains had cut away half of the urn, so that it proved impossible to reconstruct it completely. The material of this urn showed greater resemblance to that of the previously recovered lids than to the material of the urns described above. The height of the portion discovered in situ is 85 cm. Judging by its shape, the urn must however have been considerably higher. In the earth still remaining inside the urn some fragments were found, among others a portion of the urn rim, and a large fragment of the wall of the vessel carrying a curved projec-

tion of solid clay. There were no skeletal remains. Whether the projection just referred to had pointed upwards or downwards cannot be inferred. Of the clay vessels from Pampa Grande that are depicted by AMBROSETTI (4, figs. 17 and 18), two are provided with projections of a shape resembling that which is here referred to, although smaller.

In the upper portion of the wall of the vessel the material has a thickness of about 1 cm. It gradually increases towards the bottom, and the bottom portion itself — which is slightly incurving, and with a diameter remarkably small in proportion to the size of the vessel, only 12 cm. — is more than 2 cm. thick. The entire outside of the vessel has been polished with a maize cob, and the striation resulting therefrom is very marked. The inner side of the vessel had disintegrated from decay,

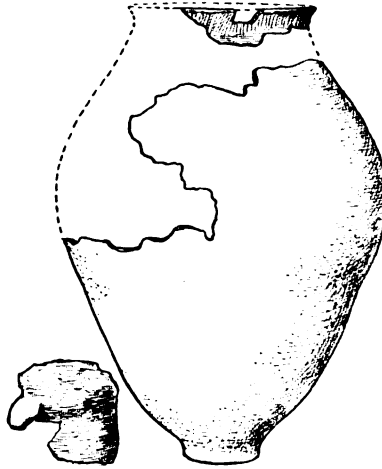


Fig. 24. Sepulchral urn, and a fragment of the same with a curved projection of solid clay, Quebrada de la Virgen. (G. M. 33.15.753).

and thus it was not possible to determine whether its surface had been treated similarly to the outer side. The difference in quality between the clay material of funerary urns and that of the present urn and the lids is easily seen if one rubs the fracture surface of a fragment with one's finger. Sometimes, if the fragment comes from a lid, or especially from the urn here dealt with, small particles crumble off from the surface of the fracture, but this only happens very seldom in the case of the funerary urns. These funerary urns of inferior quality nevertheless no doubt belong to the same culture as the rest, but have an appearance of having

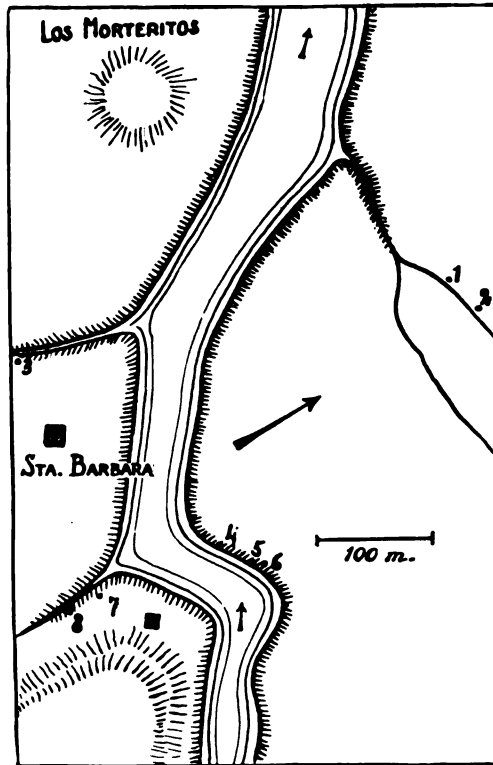


Fig. 25. Sketch map of the Sta. Barbara site, La Candelaria.

perhaps been manufactured for the occasion like the majority of the large sepulchral urn lids. No archaeological relics were discovered in the ground surrounding this site, which therefore does not appear to have been occupied for any greater length of time.

Santa Barbara.

The sketch map, fig. 25, shows the position of the archaeological sites at Sta. Barbara, and fig. 26 illustrates part of the area in which the finds were made. This area, as will be seen, consists of a small plain, bordered in all directions



Fig. 26. Rio Santa Barbara. Photograph taken, while facing east, from the house marked «Sta. Barbara» in the sketch map, fig. 25.

by low hills or mountain slopes. To a great extent the plain is open, but parts of it are densely wooded. A small and isolated rocky eminence, Los Morteritos, in the middle of the plain will be dealt with separately. Across the plain runs an affluent to the Rio Candelaria, known as the Rio Santa Barbara. At the time of my visit the broad bed of this river lay dry except for a small rill in its deepest parts. A number of minor gullies, dried up at the time, also cut through the plain. All of them flowed, into the Rio Santa Barbara. All the watercourses were deeply sunk, and it was in their walls that the archaeological finds here dealt with were made. This also applies to some ten detached finds, consisting of stone objects and pottery fragments with engraved ornaments, bought from local inhabitants.

In a gully leading into Rio Santa Barbara from the right two funerary urns were found, numbered 1 and 2 on the sketch map, fig. 25.

Grave 1. (Figs. 27 and 28). Marked 1 on sketch map, fig. 25.

The funerary urn had been discovered by a mestizo, and had by him already been partly excavated. In doing so he had discovered the earthenware bowl depicted in fig. 28, which was acquired by me, and led to my also taking over

the urn, which had been badly damaged by rain water. The urn was found in an upright position, in the upper part of the bank of a right-hand gully (cf. map, fig. 25.) The depth below the ground level of the lowest bottom portion of the urn was 2 m. In the portion of the bank above the urn no stratification of the earth was observable from which the level of the ground at the time when the burial

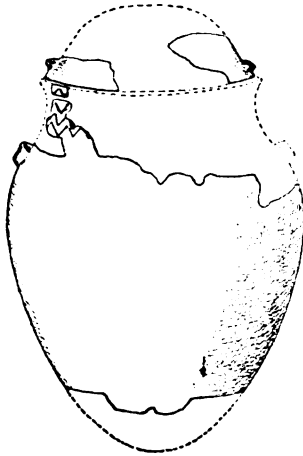


Fig. 27. The urn from grave I, Sta. Barbara. (G. M. 33.15.738, a—b).

took place might be determined, nor was it possible to ascertain the size or shape of the pit into which the urn had been deposited. The distance between the lowest portion of the urn and the bottom of the gully was from 3 to 3.5 m. As will be seen from fig. 27, the entire bottom of the urn and a large portion of the rim are missing. The mestizo that had discovered the urn had only excavated about half of its contents, and it was there he had found the bowl mentioned above.

In the soil that remained were found skeletal remains and fragments both of the bottom portion

and the rim. The skull was extracted from the soil, but soon fell to pieces when exposed to the open air. Most of the pottery fragments that were collected inside the urn here discovered were unfortunately destroyed by fire in an accident which happened to the collections during their transport in the Argentine, and on that account it has proved impossible to reconstruct with absolute certainty the original shape of the urn, especially the bottom portion. Whether a hole had been knocked through its bottom cannot therefore be ascertained. So much is however preserved of the urn that in the upper part of the portion discovered in situ it is possible

to discern the lowermost of the engraved, parallel zigzag lines with which the neck portion of the funerary urn was decorated. The original number of these zigzag lines cannot be determined because the rim fragments found in the excavation of the urn cannot be fitted to the portion excavated in situ. The largest diameter of the urn is 95 cm. The material of the bottom portion is about 1 cm. thick. The engraved neck portion has a thickness of about 6 mm., but becomes thicker in the edge of the rim where it is about

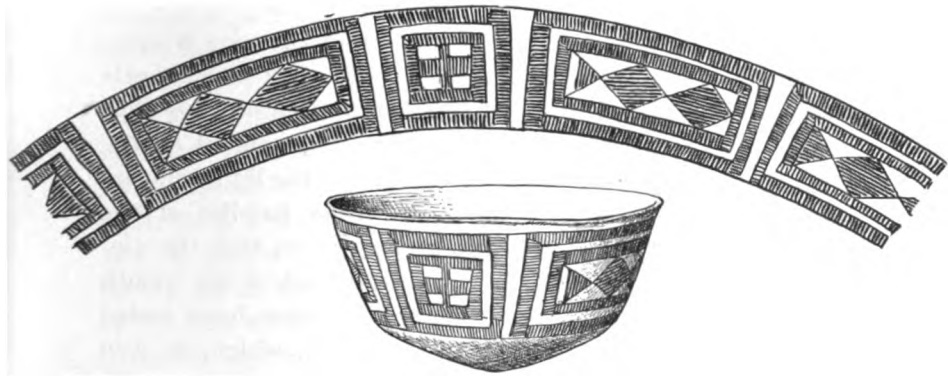


Fig. 28. Bowl with incised ornaments, found inside the urn in fig. 27.
(G.M. 33.15.738, c).

15 mm. thick. The engraved lines found on the neck of the vessel appear as corresponding ridges on its inner side. The exterior of the urn is of a brownish grey colour and the surface well finished, possibly with slip, but it is here and there possible to discern with the naked eye stone particles with which the clay is mixed. On the lower portion of the vessel parallel, shallow furrows slanting upwards from its bottom can be seen in places. These depressions are probably finger-marks left there while a finish was being put on the walls of the urn before the firing.

Fragments of the bowl that served as a lid were discovered in the urn's interior. The material of these fragments is of a quality differing from that of the urn, just as was the

case with grave 2, of El Paso de los Antiguos. The urn lid discovered at that place is of a somewhat brownish-coloured material, while in this case it may be described as blackish grey. The body of the bowl has a thickness of about 10 mm., and its rim about 15 mm. With the exception of a narrow border next to the edge of the rim, the outer side of the lid presents striated marks from the maize cob used in polishing it. This striation is, however, in parts covered by a crust of soil and stone particles chemically combined with the material in the surface of the lid. How this encrustation has come about is uncertain, but a similar covering is occasionally seen on the outside of the bottom of clay vessels from La Candelaria, and it is therefore not improbable that it has been caused by the vessel having been placed on the ground in a heap of live cinders. On two of the lid fragments found were attached crescent-shaped ridge handles of the type seen in fig. 110, *f*. It may be mentioned that the diameter of the lid was probably less than that of the mouth of the urn. It would seem that the lid must have rested on the inner side of the neck of the vessel, which, as seen from the figure is slightly incurving.

As I have already mentioned, this urn had been partly excavated prior to my arrival, and the bowl, fig. 28, had then been found. It has a diameter of 18 cm., and a thickness of 4 mm. Its sides are finished with slip, and are of a shiny black colour. Apart from a trifling defect in the edge of the rim, the bowl is intact. Its bottom is partly flat. It is on the outside ornamented with a band whose appearance is seen in the figure. The ornamentation has been produced by contrasting plain panels with others filled in with parallel, incised lines. The ornamented border consists of two rectangular panels, framed in double lines, in which are inscribed two rhombs and a triangle, and one panel more in the shape of a square, similarly framed, but with a central figure in the form of a cross. It is probably from want of space that the last-mentioned panel has been

made to replace another of the appearance already mentioned. The edge of the rim curves slightly outwards.

From the skeletal material, which was very fragmentary, it appears that an adult male had been buried in this urn.

Grave 2. (Fig. 29, *a—c*). Marked 2 on sketch map, fig. 25.

Both the funerary urn and its lid were complete destroyed in the fire already referred to, through which part of the collections were lost while on the road, and thus I must content myself with referring to the photographs that were taken in the field.

This urn was discovered in the same gully as the preceding one. The depth below the ground level of the rim of the urn was 130 cm. The height of the urn was 1 m., and its diameter measured 90 cm. After the urn had been excavated, a measure was taken inside it from its bottom and up to the highest point of the bowl that, overturned, served as a lid. This distance was 115 cm. The position of the urn when in situ is apparent from fig. 29, *a*, where it can be seen below the man's left arm.

As regards shape and material, this urn corresponded with the next preceding one. It, too, was decorated with repeated zigzag lines below the rim of the mouth. This ornamentation is seen in fig. 29, *b*, and also a crack right across the rim and the neck. A couple of holes have been bored on either side of the crack. It is evident these have been made for the purpose of closing up the crack with string passed through them. This method of crack-lacing is found in several other La Candelaria finds. It mainly occurs in the plateau regions of western South America and in a sporadic way on Rio Xingu and among the Ijca Indians of Santa Marta, in Colombia. Its presence in the Chaco region must be ascribed to existing communication with the highland (LINNÉ, 2, p. 156 and foll.; 3, p. 210 and foll.)

The thickness of the lid was about one centimetre, and its outside markedly striated. Its colour was more brownish

than in the preceding case. The two rim-bosses with which this lid was provided were of massive proportions, and almost square in shape. One of them can be seen on the left in fig. 29, *b*. These bosses are placed opposite each other.

At the examination of the soil inside the vessel there were, at a depth of 70 cm. measured from the top of the bowl covering the funerary urn, discovered some fragments of charred wood. This is not the only instance where charred wood has been found inside a funerary urn in La Candelaria. SCHREITER (I, pp. 58 and 59), for example, also found fragments of charred wood in one or two of the urns he excavated in La Candelaria, and BOMAN (2, p. 67) made similar finds in some funerary urns in the province of La Rioja. Schreiter considers that charred bits of wood were deposited in funerary urns from a ritual motive. Boman mentions that the Lengua Indians place fire in the grave along with the corpse (GRUBB, p. 172), and that a similar custom prevails among the Caingangs (AMBROSETTI, 8, p. 348). NORDENSKIÖLD (16, p. 13) mentions, as regards children's sepulchral urns from Arroyo del Medio, east of the San Francisco Valley, that live cinders must have been deposited along with the corpse. In the case of the La Candelaria find here dealt with, local conditions also suggest that the charred wood remains may have been placed within the urn after the corpse, seeing that it was underneath them that the first finds of skeletal remains were made. The latter were recovered from the soil stratum next to the bottom of the urn. At one side of the bottom lay the skull, while the jaw belonging to it was at the opposite side (cf. fig. 29, *c*). These remains were too badly decayed for collecting, but could however be determined as having belonged to a grown person. Together with the skeletal remains were found two white, very brittle stones and an unworked bone of some small quadruped (cf. Appendix II, find G. M. 33.15.744).

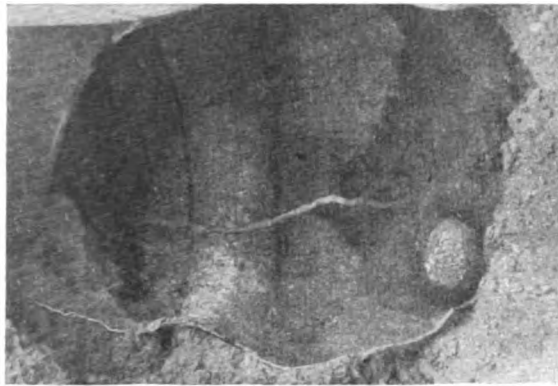
It may be mentioned that within the urn, in the soil above the skeletal remains, several stones were found of such a



a



b



c

Fig. 29. Grave 2, Sta. Barbara. a, shows the urn in situ in the gully, visible below the right arm of the person in the picture. b, the urn in the course of being excavated, and c, after most of its contents had been removed. A skull can be seen in situ to the left of the root that had grown right through the urn.

large size that they could not very well have slipped into the urn through the open cracks in the lid. It is therefore not impossible that among the Indians of La Candelaria burial was carried out in such a way that the urn was first set down in the pit dug in the ground, and thereupon the body, with the knees drawn up to the chin was deposited within it. The urn would finally have been filled up with soil, and then a piece or two of charred wood may also have got into it. The bowl that was to serve as a lid was placed, bottom upwards, over the mouth of the urn, and finally the grave was filled in with earth. Interesting in this connection is the description that CORRADO and COMAJUNCOSA (p. 52) give of urn-burial among the Chiriguano. It runs as follows: »Entre tanto se va cavando en la misma casa mortuoria una fosa profunda dos ó tres metros, se coloca en ella un gran yambúi (earthenware vessel in which maize beer is fermented) y finalmente se deposita en este el cadáver, aovillado del modo ya referido, y con la cara vuelta al oriente». SANCHEZ LABRADOR (vol. I, p. 62) gives the following description of urn-burial among the Itatines. »Al enfermo, cuando quería agonizar, le metían en una tinaja de boca ancha; tapábanlo con un plato á modo de cobertera y así le enterraban dos veces, una antes de morir en la tinaja y otra con la tinaja en tierra. Al lado ponían otra olla también cubierta, dentro alguna comida». From Sanchez Labrador's above quoted description of urn-burial it will, however, be seen, that the dead person was first placed within the urn, and that this was thereupon lowered into the pit that had been dug in the ground. Here, as in the case the sepulchral urns of the Guarani Indians, the urn would seem to have been devoid of handles. In neither of the two instances here cited, it may noted, was the urn filled with earth after the dead had been placed within it, and, as MÉTRAUX (5, p. 270) has pointed out as regards the mode of burial prevalent among the Tupi-Guarani Indians, the idea is to prevent, as far as possible, the soil from pressing upon the interred person. The in-

stance here cited from La Candelaria, where the urn appears to have been filled with earth subsequent to the body having been deposited within it, may therefore be ascribable to mere fortuity, or even to misapprehension of the report of its finding.

None of the vessels used in La Candelaria as funerary urns are without handles. These would however hardly have been strong enough for use in lowering the urn, with the body already inside it, into the burial pit. Nor is it probable that urns were provided with handles only for being moved about once or twice, as would have been the case if these large clay vessels had been exclusively made to serve as funerary urns. This detail, in conjunction with the fact that cracks had been so carefully mended, suggests that urns used for burials had originally been manufactured for some other purpose and that, as already suggested above, their employment as funerary urns was of a secondary character. If one supposes that the large sepulchral urns of La Candelaria were primarily designed for using as containers wherein algarrobo or chañar beer was fermented, it is conceivable that the beer may have been ladled out of the vessel with scoops of the type seen in fig. 95.

At a spot in the gully located in the same wall as where the graves 1 and 2 were discovered, and about midway between them, an archaeological stratum was discernible, about 50 cm. below the present ground level. This stratum had only a width of from 1.5 to 2 m., and the vertical distance between the fragments at its bottom and top, respectively, was only a couple of centimetres. All of these potsherds, of which there were only about twenty or so, were unornamented and came from different clay vessels. In material they corresponded with the rest of the La Candelaria finds. Below this spot lay a grinding stone which had probably slid down from the archaeological stratum just referred to, and had come to rest on the bottom of the gully. These spare relics

indicate that the dwelling site, at the time when it was occupied, lay about 50 cm. below the present ground level, and that the funerary urn just described was lowered into a pit about 1.8 m. deep.

Grave 3. (Fig. 30). Marked 3 on sketch map, fig. 25.

In a gully — like the previous ones, also dry at the time of my visit — on the left side of Rio Santa Barbara another urn was excavated. It was not included with my collections on account of its having been badly damaged by rain-water and the flow of the gully. It was embedded in the vertical wall of the gully, and more than half of it had been washed away by rain-water. This find differed from those already described in that the mouth of the urn had been covered over with two flat stones. By the weight of the superimposed soil, to the thickness of about 2.5 m., these had been pressed down so as to form a V. Their position, and that of the urn, is shown in the figure by a dotted line. SCHREITER (I, fig. 17: 1 and 5) also provides authentication of this method of covering sepulchral urns. Not even a fragment of the rim could be found, and no doubt the vessel lacked rim already prior to its being used as a sepulchral urn. A couple of stray fragments of the urn, discovered in its immediate vicinity, showed that the vessel had been ornamented with two parallel rows of dots engraved in the soft paste before baking. The exact appearance of this decoration could not be ascertained. The clay material was of a dark-brown colour, in parts almost greyish black, and about 8 mm. thick, but otherwise of a character practically identical with that seen in the urns described in the foregoing. In the soil that was filling up the urn no finds were made. The diameter of the widest part of the vessel would have been about 80 cm.

Finds 4—6.

In the steep bank of the river Santa Barbara, at the spots marked 4-6 on the sketch map (fig. 25), a series of test

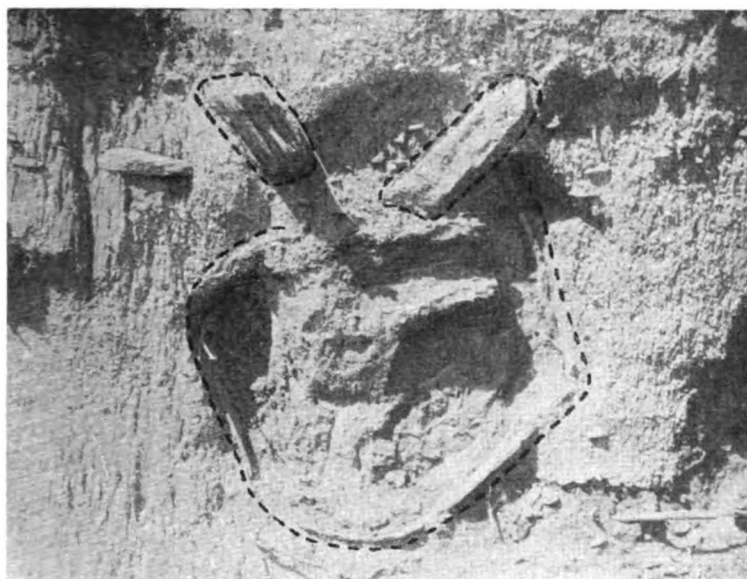


Fig. 30. Section of urn found in a gully, the remainder of it having been worn away by the action of flood-water. The stones that covered the mouth of the urn, and the contour of the urn itself, are marked by dotted lines.

diggings were made in which archaeological remains were discovered in three different places (fig. 31). These finds consisted of potsherds and skeletal remains. The soil at the spot was seen to consist of different strata. From the surface of the ground to a depth of about 75 cm. the soil was sandy and mixed with pebbles, evidently water-rolled, and in colour light-brown. The stratum next below, which extended a further 125 cm. downwards, was of a similar consistency, but of a darker colour. Again below this was a 50 cm. thick stratum which was rich in round, water-worn stones, in size averaging that of a hazelnut or a walnut. The bottom portion of this stratum contained the greatest quantity of stones. The last of these strata, which resembled the top one, reached all the way down to the bottom of

the gully. The finds of which a description follows were discovered in the very top of the third, most stone bearing, stratum.

Find 4. Marked 4 on sketch map, fig. 25.

In a small area only measuring a few square metres some ten fragments of different clay vessels were discovered (G. M. 33.15.743). One of these fragments was provided with a handle, another showed part of a rim, below which it was ornamented with a zigzag line. Other fragments were similarly ornamented but lacked the rim portion. Most of the fragments, however, were ornamented. A number of bone fragments were also collected, all of which, with the exception of two, were however too fragmentary for determination (cf. Appendix II, find G.M. 33.15.743).

Find 5. Marked 5 on sketch map, fig. 25.

About 20 m. west of the foregoing find, remains of a skull were discovered in the steep river-bank (G. M. 33.15.740). Dr. C. O. FORSELIUS has determined this skull as having belonged to a wellgrown, adult person who had at least reached middle age. In the skull the sagittal sutures are deeply sunk. The occipital bone is missing, but its position can be determined with certainty. The internal diameter from the root of the nose to the back is 15 cm. The crest along the sagittal suture of frontal region shows a slight convexity towards the left, resulting in the right frontal protuberance having become broader than the left. It is also somewhat deeper towards the front. Corresponding to this, the posterior parietal and occipital regions of the left side appear slightly deeper. At the line of fracture the bone has a thickness of 4—6 mm. Outer and inner corticalis massive, diploe not sparse.

Find 6. Marked 6 on sketch map, fig. 25.

This also consisted of potsherds, mostly unornamented (G. M. 33.15.742). It was located in the wall of the river



Fig. 31. The steep right-hand bank of Rio Santa Barbara, with the places where finds 4—6 were discovered marked in the picture.

bank, about 10 m. west of the preceding one, and within an area of very narrow limits. Of these fragments, two included handles, three were rim fragments, and three of them were rugged on their outer sides. One of these fragments is depicted in fig. 32. In them, the impressions that can be seen have, like the striation marks, been produced by a shelled maize cob. If in polishing the wall of a clay vessel the maize cob is grasped so as to remain in one position, a striated surface results (fig. 15, *a*), but if it is allowed to rotate, in the same way as a roller stamp or cylindrical seal, the surface so treated is given the appearance seen in fig. 32. Beyond these potsherds, about 2 m. within the river bank, skeletal remains of a powerfully built person were found. These bones were all broken up into small pieces, and were lying about in disorder.

It seems probable that the archaeological area just described (finds 4—5) formerly constituted a dwelling site, with funerary urns, but that this site subsequently was ruined by the flow of rain-water. The pottery fragments constitute remains of funerary urns, broken up by earth pressure, after

which bones and pottery fragments have been disarranged by rain floods. In a later period the site has again been covered with earth.

Into the opposite side of the river led a gully, and here, too, some finds were made.

Find 7. Marked 7 on sketch map, fig. 25.

Just in the mouth of the gully a number of pottery and bone fragments were found (G. M. 33.15.741). Some of them



Fig. 32. Clay-vessel fragment showing impression of a shelled maize cob. (G.M. 33.15.742, h).

had been washed to the bottom of the gully by rain-water, but the majority were found in the perpendicular wall of the gully at a depth of 175—200 cm. Four of the pottery fragments were provided with ordinary handles, two with crescent-shaped ridge handles, four consisted of rim portions,

and three bore engraved ornamentation, one of the latter also showing a portion of rim. In addition a lump of cupriferous rock was discovered. The pottery fragments differed in no way from the rest of the La Candelaria finds here dealt with, and they evidently constitute debris from a dwelling site. Some 20 m. farther up the gully there was, in fact, discovered the bottom portion of a funerary urn (grave 8). The bone fragments have been examined by Dr. WALTER KAUDEN, and found to derive from different animals, viz. guanaco and, possibly, llama (cf. Appendix II, find G.M. 33.15.741). In our times the guanaco has long been extinct in La Candelaria, but its memory is preserved in certain place-names, as for instance, one of the ancient dwelling sites that will be mentioned in the following, Huanacocha.

As regards finds of llama bones, see the description of the archaeological site Unquillo.

Grave 8. Marked 8 on sketch map, fig. 25.

As mentioned above, only the bottom portion of the funerary urn was discovered in situ (G. M. 33.15.752). In the surrounding soil, and in the part of the gully below the funerary urn were discovered a number of pottery fragments evidently originating from the urn. Unfortunately this find was among those which were ruined by a fire in the course of transportation, on account of which I am here only able to give some scanty information regarding it. The bottom portion of the urn lay at a depth of about 2.5 below the level of the ground. It was somewhat rounded, and not so flat as in the urn seen in fig. 63, *a*. A hole about 15 cm. in diameter had been knocked out in the bottom. The wall of the vessel was about one centimetre in thickness, and the material of a sooty grey colour. Its outer side was probably slip-treated, while in the bottom it presents marked traces of striation from a maize cob. The diameter of the portion of the urn discovered in situ was about 75 cm., and in its bottom a hole with a diameter of 20 cm. had been knocked out. No skeletal remains were found.

The finds just referred to, Nos. 4—8, no doubt originate from the same dwelling site. Whether the preceding finds, Nos. 1—3, derive from the dwelling site we are here concerned with is, however, uncertain, seeing that they were found at a considerable distance from the rest.

It may be supposed that the Rio Santa Barbara always ran through this dwelling site. As has already been pointed out, while on the subject of finds 4—8, this watercourse has already once previously done damage to the funerary urns of the site. Now this river is again eroding the entire area of the site that once formed a human habitation. Only the urns situated in the outskirts of the ancient dwelling site,



Fig. 33. «Los Morteritos», a northeastern view. The second man on the right marks the position of two mortars. Each of the remaining persons seen at the foot of the hill marks the position of a mortar, while below the trees on the top of the hill three more depressions are found. The latter are seen in fig. 34.

finds Nos. 1—3, have so far escaped the beginning destruction, but even there the affluents of Rio Santa Barbara have now started on a course of obliteration.

«Los Morteritos».

Near the western bank of the Santa Barbara river, and about 500 m. northwest of the small homestead of the same name, there rises a detached hill, covered with a few, scattered trees, cactuses and shrubs (cf. sketch map, fig. 25 and fig. 33). This hill is strewn all over with large and small boulders, probably formed by the splitting up, by weathering, of the surface stratum of the ground-rock of which the hill is built up. It is frequently difficult to determine whether the exposed rock is merely a boulder or the bedrock itself because fissures and depressions are filled with soil. Its name of «Los Morteritos» has been



Fig. 34. «Los Morteritos». The top of the hill. The knife in the foreground is placed in a mortar, and the positions of two more depressions of this type are marked by the two persons in the picture. Photographed from the northwest.

given to the hill because of the mortar-like depressions (figs. 33—35) which are found hollowed out in detached boulders or possibly in the bedrock at the foot of its northwestern slope and on its summit. Their exact position will be seen from figs. 33 and 34. On the summit there are three such mortars. Two of them have a diameter of 19 cm., while that of the third measures 18 cm. Their depths are respectively 20, 27 and 14 cm. At the foot of the hill there are further five depressions, one of which — the largest — has diameter and a depth of 30 cm. The remainder of these latter were of dimensions similar to those on the crest of the hill. As I have already mentioned, weathering debris and soil had filled all the fissures, and thus it was impossible to determine whether all these mortar-like depressions had been hollowed out in the bed-rock or in independent boulders. All these depressions were vertical and of a regular cylindrical shape.

At the bottom they were slightly rounded, being deepest at the centre, and the rim of the mouth was also rounded off. The inner sides of these mortars were quite smooth, and the depressions appeared to have been produced by pounding. In places, minor and irregular hollows could be seen, apparently the work of nature. In one instance two such depressions, a few centimetres deep, were found in immediate proximity to one of the concavities in the rock described above, and thus it is not improbable that, in carving out a mortar of the above description, the work was begun in a natural depression of this kind. In the southeastern slope of the hill, i. e. on the side opposite to that on which the mortars were discovered, a number of unornamented pottery fragments were found, of a similar greyish black material and with surfaces of the same smoothness as are frequently seen in funerary urns. No other traces of habitation were discernible in the proximity of this hill.

Archaeological literature dealing with northwestern Argentine abounds in references to depressions, hollowed out in blocks of stone, like those here described. As regards the purpose of these hollowed-out stone works, there has however so far been no unanimity of opinion. Two explanations of these finds have been advanced, one to the effect that they served as mortars, and the other that they were hollows designed to collect water in the dry season. As I am of the opinion that the first of these explanations is the correct one, I have chosen to refer to these depressions as mortars.

From Viluco, in the province of Mendoza, TORRES (3, p. 297) mentions mortars fashioned out of blocks of stone, and so do BOMAN (8, pl. I, figs. 1—2), and MÉTRAUX (2, pl. XI and fig. 40). In these cases stone mortars appear in association with rock-carvings. APARICIO (2, p. 462) also mentions stone mortars from the highland region in the San Luis province, and adds that in that province mortars occur sporadically, and not in groups as in the province of Córdoba. Thus in San Luis he knows only of one instance

where a number of mortars have been found together. APARICIO (3, p. 120 and foll.) also describes stone mortars from the ancient habitation centre of the Comechingons in the highland of Cordoba. These mortars are to this day used as such by the local inhabitants. In another work of his, APARICIO (1, p. 135 and foll.) states that the inhabitants of the region in question at the present day use wooden mortars as well as mortars of stone for pounding maize. The latter category are not manufactured nowadays, but ancient ones are used, and the situation of such an old-time stone mortars frequently constitutes a decisive factor when it comes to choosing a new site for building a house. In many instances the portion of the rock containing the mortar has been detached by blasting in order that it might be



Fig. 35. «Los Morteritos». One of the mortar-like depressions at the foot of the hill.

carried away. Stone mortars are abundant in this district, but only a few of them are nowadays being used. In certain places they are, as already mentioned, found in groups. In diameter they vary between 7—32 cm., and their greatest depth is 26 cm. In this locality, as in La Candelaria, minor depressions are found in close proximity to larger ones. In some mortars Aparicio has observed a ledge, that is to say, the largest diameter is found at the mouth and decreases but slightly downwards to begin with, but at a depth of a deci-

meter or so the diameter of the mortar is suddenly reduced to about one-half (APARICIO, I, fig. 42). Aparicio opines that this shape of the mortar has been evolved from necessity, in that, in order to be able to stand upright while working, a shafted stone pestle was used. To either side of the pestle two sticks were lashed (APARICIO, I, fig. 42), and he also depicts a pestle provided with grooves for facilitating its fastening to the sticks (APARICIO, I, pl. LXXX, b). After having been in use for a certain length of time the mortar is worn so deep that the sticks do not clear the edge of the mouth, and then it would have been necessary to cut down the area surrounding the mouth in order to reach the bottom of the mortar with the pestle. A shelved mortar of this type, from Cerro Varela in the province of San Luis, is also mentioned by GRESLEBIN (I, fig. 5, b). LEHMANN-NITSCHKE, too, describes some mortars situated near Capilla del Monte in the same province. Here the mortars are scattered without apparent coordination in a large piece of rock, and, as is the case in La Candelaria, not far from running water. LEHMANN-NITSCHKE (p. 220) quotes a statement by Lafone Quevedo to the effect that mortars were hollowed out in the neighbourhood of water for greater convenience in moistening the maize before pounding it. My theory is that the maize was moistened in order to prevent it from coming out of the mortar as it is apt to do when pounded with a pestle, a state of things which undoubtedly largely contributed to discarding mortars in favour of grinding mills. DEBENEDETTI (5, p. 393), states as regards the stone mortars found in the province of La Rioja, that pottery fragments are seldom seen in the vicinity of the mortars. From the province of Tucuman stone mortars are mentioned by BRUCH (I, figs. 19—21). Of the three mortar-sunk stone blocks that he depicts, two show a great resemblance to those of La Candelaria, while on the third (BRUCH, I, fig. 21) a number of smaller depressions are seen, often as many as six, arranged in a circle round a deeper cavity in their centre. These

depressions also differ from those of La Candelaria in that they are cup-shaped, very shallow, and of a smaller diameter. In association with the depressions, carvings in the rock are also found here.

SCHREITER (3, pl. XIX—XXIII) also gives a number of instances of stone mortars occurring in the province of Tucuman. AMBROSETTI (4, fig. 7) depicts a block of stone hollowed out with mortars, from Pampa Grande in the Salta province. At this place he made, as we know, finds greatly resembling those here dealt with from La Candelaria.

Going beyond the borders of the Argentine I may mention some instances of stone mortars being hewn out of boulder-stones. Msgr. FRANCISCO BERTOLDO BUEHL, the Apostolic Vicar of Chiquitos, has been kind enough to send to the Ethnographical Department of the Gothenburg Museum a photograph showing a large boulder with a mortar carved out in its highest part. It was found at Guarayos. RIVET and VERNEAU (pl. XIV: 1), in their important work on ancient Ecuador depict an immense boulder-stone, in the upper part of which there is a mortar-like depression partly surrounded by a semicircular, deep channel. This rock is situated at Isavieja, near Cañar. From Colombia LUNARDI (figs. 12—15) publishes a number of stone mortars hollowed out in some rocks near a spring. These mortars may be supposed to have possessed some magic significance, in view of the fact that among them is also found a stone on which a human face has been carved. REQUENA (p. 245) publishes an illustration of a large boulder from Mariara in Venezuela, in which at least thirteen mortar-like depressions have been hollowed out.

In North America, too, stone mortars resembling those of La Candelaria are found. FULTON (pl. I), for example, gives some illustrations from Texas Canyon in Arizona, and KROEBER (pl. 45) depicts a large boulder-stone with mortars and appurtenant pestles, once in use among the Miwok Indians of California. Also HODGE (vol. I, pp. 943—944) illustrates stone-boulders with mortars from California. Of

especial interest is a picture showing a group of Yokut women sitting together at work at a boulder thickly dotted with mortar depressions. Even among present-day Chaco Indians it is noticeable how the women tend to carry on their daily occupations, such as spinning, cord-making, pottery-making, etc. gregariously, and this craving for company may well account for the presence of a plurality of mortars in a given boulder. Mortar-like depressions are mentioned from Kentucky by WEBB and FUNKHOUSER (p. 708), and from Texas by PEARCE and JACKSON (pp. 18—19). As regards the Kentucky mortars, these are especially interesting in the method employed with a view to raising the bottom when it has worn too deep. This was done by placing a broken-off pestle in the hollow.

Above I have mentioned the theory advanced by Argentine archaeologists that the stone-carved depressions here dealt with were designed for collecting rain-water in dry seasons. In an essay of his, VIGNATI (2) has discussed these stone mortars from this point of view. What makes him doubt that they are mortars is the circumstance of their frequent occurrence in such close proximity to each other that they could not have been used simultaneously. There are instances of only a 6 cm. wide wall of stone separating a mortar from its neighbour. Vignati has also remarked upon the frequent connection of the mortars with each other by a channel. If to this be added that in certain cases these hollows have been made in rock the inferior hardness of which speaks against its suitability as a mortar. Vignati emphasizes that in certain cases the cavities in question may have served some other purpose, that of receptacles for rain-water during the dry season. In this connection he cites a passage from REGINALDO DE LIZARRAGA (*Descripción colonial*, Biblioteca argentina 14, II, segunda edición, Buenos Aires 1928, p. 237). "por el camino hay unas hoyas hechas a mano por los indios que allí habitaban, donde se recoge el agua, hallámos las llenas, y el agua muy sabrosa y fría".

Vignati thinks, however, that the assertion that these depressions are for collecting water is equally plausible as that of their being mortars. FRENGUELLI (pp. 153—160) also considers that the hollows in question were made for collecting rain-water. He observes that in Cordoba they are always found in the vicinity of dwelling sites and in districts poorly provided with water. He also describes a mortar-like depression, capable of holding 172 litres of water and radiating with grooves designed to collect such rain-water as might fall on the rock by which the depression is surrounded.

A circumstance arguing against the theory that the depressions served as reservoirs for the collecting of rain-water consists in their often being found at the highest point of the boulders, and that in most cases their capacity is so small that the amount of water they might have been able to collect would not have sufficed for any but a very small number of people. The instance cited by Lizarraga, where water was obtained from depressions in a rock, was possibly of a purely accidental character. It would be interesting to know the depths of the different mortars in cases where a number of them have been found in the same place. For it is conceivable that when a mortar became too deep for the pestle to reach its bottom, a new mortar was hollowed out close to the old one. The fact of these depressions being used as mortars in certain localities to this day seems to speak in favour of this theory.

It is however not impossible that in certain cases, at any rate, these hollows were of a different character. In the foregoing I mentioned two instances of rock-carvings found in the same rock as the depressions. Of especial interest is the block of stone depicted by BRUCH (I, fig. 21). In this case it is out of the question that the depressions were meant for mortars, seeing that they are far too shallow for such a purpose, which instead appears to have been a ritual one. In this connection certain observations made

by AMBROSETTI (3, pp. 40 and 43—44) in his examination of the ruined city of Quilmes, in the Calchaqui valley may also be mentioned. Within the ruins of the houses, besides grinding stones he also found mortars hollowed out in small-sized blocks of stone, in addition to which mortars hollowed out in large blocks were found in the open ground. The hollow had been made in the centre of a flat surface which had been placed as level as possible. He describes two finds of this type, one consisting of a single block of stone, the other of four blocks lying close together. In both cases a circle of stones had been built up round the mortars. Thus the four blocks were surrounded by a common circle of stones, within which, in addition to the blocks, were also found four grinding stones (conanas). AMBROSETTI (3, p. 44) describes these finds as "morteros publicos", and of special interest is what he writes in regard to these finds.

"Esta curiosa disposición de varios morteros y conanas, también en otra plazoleta y cerca de otro grupo de edificios, no deja de llamar la atención; pues morteros dentro de la ciudad de Quilmes se hallan en todas partes, dentro y fuera de las casas, y principalmente en las grandes rocas á flor de tierra que tienen uno ó varios.

De manera que estas construcciones que nos ocupen ahora, no es difícil hayan tenido un objeto especial, un ritual religioso por ejemplo, donde se moliese el maíz ó el quinoa para fabricar ciertos panes, ya fuera para los sacerdotes, ya para las ofrendas ó para algunas ceremonias parecidas á las que los peruanos hacían con el Pan Kancu ó Zancu en sus fiestas de Rayme y Citua.

Algo de esto, un resto de atavismo, existe en esos lugares; por ejemplo, en algunas puntos, las mujeres acostumbran ir á ciertos morteros de esos que hay cerca de los ríos, en las grandes piedras, á moler su maíz, y sé de buena fuente que hacen su invocación á la Pacha Mama á fin de que no se les lastimen los dedos.

Desgraciadamente, he recogido este dato un poco tarde, y no he podido conseguir el texto de la invocación, la que no pierdo la esperanza de recoger en otro viaje."

La Banda.

About half-way between Santa Barbara and the village of La Candelaria there is a section of land known as La Banda. This consists of a plain, with low and fairly sparse trees and a dense shrub vegetation. A few small gullies traverse this plain. Here, as in several other archaeological sites in La Candelaria, it is noticeable that the brush-covered ground is slightly raised above its surroundings, owing to the binding action of the brush roots on the soil, while elsewhere the latter has been more exposed to erosion by the flow of rain-water. In elevated ground of this kind,

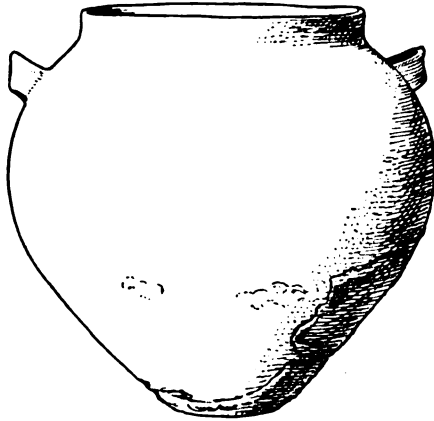


Fig. 36. Sepulchral urn. La Banda, La Candelaria. (G.M. 33.15.715).

about 20 m. east of the path, the funerary urn seen in fig. 36 was discovered. In its vicinity nothing could be discovered to show that the space once had been an Indian dwelling site. When discovered, the rim of the urn was just visible in the ground surface. No trace of any bowl-shaped vessel that might have served as its lid could be seen. In parts the urn had been burst into fragments by the roots of an adjoining shrub, but the fragments had very largely retained their relative positions. Part of the rim was, however, missing, as also one of the handles. No discoveries were made in the earth that filled the interior of the urn. The

material had a thickness of 5—8 mm. It is grey in colour, and of a fine and hard quality. Both its inner and outer sides bear striation marks from polishing with a maize cob. The height of the vessel is 42 cm. As will be seen from the figure, on the lower portion of the vessel there is a white coating about 8 mm. thick. It has been tested by the municipal analyst of Gothenburg, Dr. G. KARL ALMSTRÖM, who

has determined it to consist of carbonate of calcium. This coating would therefore be like lyto have been formed during the time the vessel has been embedded in the soil. We shall later on meet with a similar deposit, although of a different character, on a couple of clay vessels.



El Molino.

Fig. 37. Clay vessel from El Molino, La Candelaria. (G.M. 33.15.716).

Close to the left bank of Rio Candelaria, and just opposite the estancia of La Aranda, is another homestead, called El

Molino. In former times some sort of mill is said to have stood at this spot, hence the name. Immediately west of this homestead is a small rise, on the eastern slope of which an ancient Indian dwelling site is situated. This slope is partly grown with trees and partly open. Several funerary urns have been found here, but in the test diggings carried out by the author nothing more was discovered than a series of detached finds, all of which were in the ground surface. By purchase, however, I succeeded in acquiring two clay vessels that had been found at this dwelling site.

One of these clay vessels from El Molino is 37 cm. high (fig. 37). It has a flat bottom, and its material is 5 mm. thick. Its surface is fairly smooth and brownish grey in

colour. Whether or not it served as a funerary urn I am not prepared to say, as I do not know the exact circumstances in which it was discovered.

The second vessel, fig. 38, has a height of 53 cm. It lacks one of its handles and a small portion of the rim. The ma-

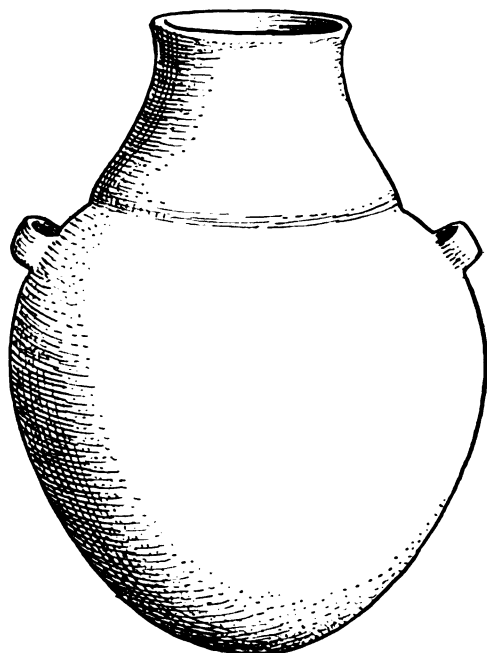


Fig. 38. Clay vessel from El Molino, La Candelaria. (G.M. 33.15.717).

terial is about 5 mm. thick, of a blackish grey colour, and of good quality. The walls of the vessel are smooth and evidently slip-finished. The bottom is rounded and knocked through with a hole about 3 cm. in diameter. The vessel is stated to have been excavated in the archaeological area at El Molino, but I could obtain no information as to how it was found. The diameter of its mouth is, however, too small to have allowed it to be employed as a funerary urn, and it is therefore more probable that it was used as a water

jar, or for preparing maize beer. The hole knocked through its bottom seems to indicate that the vessel was "killed" and included among grave equipment.

A vessel that as regards shape in many respects recalls the one just described is seen depicted in fig. 39. It was probably discovered at El Molino. Its height is 50 cm. The

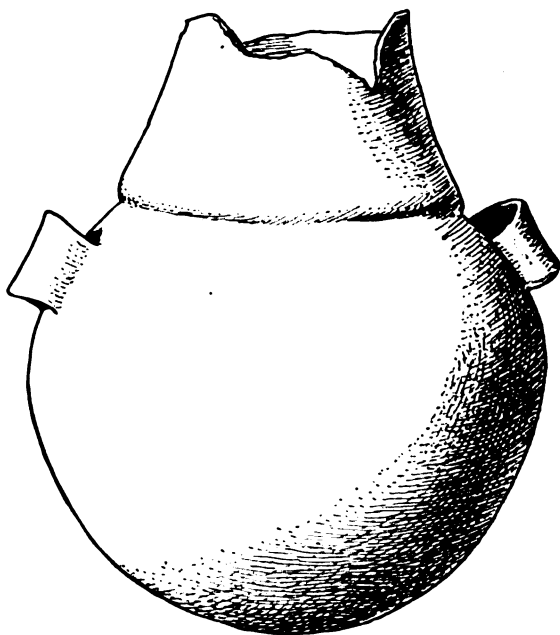


Fig. 39. Clay vessel from El Molino, La Candelaria. (G.M. 33.15.704).

material has a thickness of 5 mm., its outer surface being of a greyish brown colour which in parts approaches olive-green. It has also been given a finishing of slip-coating. The inner side, on the other hand, is of a more brownish colour. The rim is missing. The bottom is defective, so that it cannot be determined whether the vessel has been "killed". Judging from its diameter at the mouth, it is also in this case quite unlikely that the vessel was used as a funerary urn, unless for a new-born child or foetus.



Fig. 40. The archaeological site of El Quebrachal. In the foreground is seen a grinding stone, and another lies in the background next to the spade. Behind the trees on the left in the picture was found the sepulchral urn shown in fig. 42.

From this dwelling site also probably originates the male skull that has been examined by Professor J. VILH. HULTKRANTZ (cf. Appendix I, find G.M. 33.15.698). Personally I never came into contact with the finder of the cranium, and only obtained it after it had passed through several intermediaries. I was, however, informed that it had been found on the ground surface of the archaeological site here dealt with.

El Quebrachal.

One kilometre north of the estancia of La Aranda there is an ancient dwelling site known as El Quebrachal, fig. 40. As will be apparent from the photograph, this site consists of an open plain. Only round the edges of the plain a few scattered trees and shrubs are found. The surface of the ground was strewn with pottery fragments, and roughly in the centre of area two grinding stones were discovered.

Two funerary urns were excavated here.

Grave I. (Fig. 41).

This funerary urn was discovered in a small earth mound underneath a shrub, and was badly damaged by rain-water. It has not been possible to determine its original shape as the rim is missing. In its present state the urn measures 35 cm. in height. In connection with its excavation no finds were made other than a few fragments of charred wood,

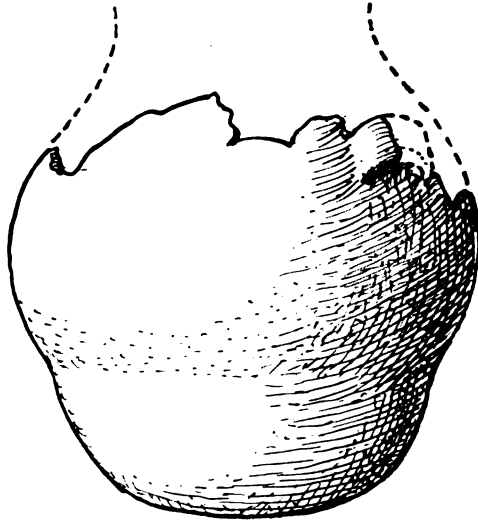


Fig. 41. Sepulchral urn from El Quebrachal, La Candelaria. (G. M. 33.15.747).

15 cm. above the bottom of the vessel. No fragments indicating that the vessel had been provided with a lid were found. The material has a thickness of about 5 mm. It is of a greyish brown colour, with distinct striation marks. The outer surface of the bottom is rougher than the rest of the vessel. In regard to shape this vessel shows much resemblance to one discovered by Ambrosetti at Pampa Grande (AMBROSETTI, 4, fig. 30).

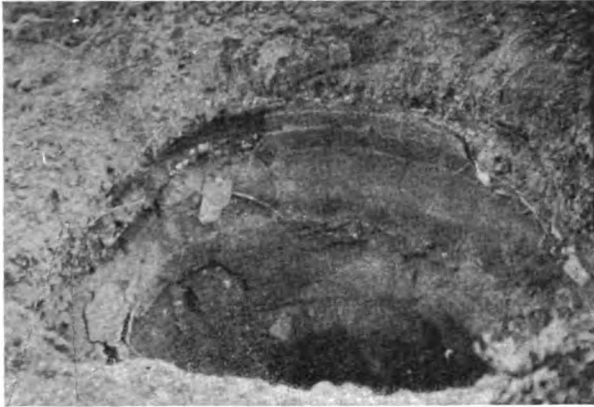


Fig. 42. Sepulchral urn from El Quebrachal. In the upper part of its farther side can be seen how the vessel has cracked along the joints between the different rolls of clay of which it has been built up.

Grave 2. (Fig. 42).

When found by me, this funerary urn had already been excavated. It had evidently been exposed to the weather for some considerable time as the surface layer of its inner side had for the most part disintegrated. Notwithstanding the extreme brittleness of the vessel, I nevertheless wished to make an attempt to preserve it, especially after having noticed that the greater part of its outer wall was covered by a white deposit layer, resembling plaster of Paris. Its preservation, however, subsequently proving impossible. I am here only able to reproduce a photograph taken of it prior to its excavation (fig. 42). This vessel had a diameter of 90 cm., and a height of 1 m. As the rim was missing, its height must have been somewhat greater. Its wall, in places where it was still intact, — i. e. at the bottom — was about 1 cm. thick. Above this it was probably somewhat thinner. In shape, it most nearly resembled the funerary urn depicted in fig. 63. The material was blackish grey in colour, the outer side provided with a slip-coating of the same colour,

and the admixture to the clay consisted of finely powdered, stratified rock. When I found it, the vessel was split up by cracks in parallel circles round the wall, one above the other. The cracks developed in this way were due to the method employed in its manufacture. In ancient La Candelaria, clay vessels were evidently manufactured by the same method that is still employed among the Chaco tribes. A small slab of clay forms the bottom of the projected vessel, the wall of which is then built up by successively coiling on its edge rolls of clay, one on top of the other. This method is still used today by the present inhabitants of La Candelaria. The only difference is that in the Chaco the clay coils are made nearly as thick as the vessel wall is finally meant to be, while by the potters of La Candelaria every clay roll is successively flattened out as soon as it is put in its place (cf. chap. XI). Thus the wall of the finished vessel will consist of flat rings. Archaeological vessels of La Candelaria, whether large or small, were manufactured by the same method, and in fig. 42 it can be seen how the urn has developed cracks along the joints between the different clay rolls by which the wall of the vessel has been built up. LINNÉ (2, p. 76 and foll.) has given a detailed description of this method of manufacturing clay vessels. The same method of pottery-manufacture still survives in La Candelaria (cf. chap. XI).

The white deposit which covered the greater part of the outer side of the urn was of a thickness varying between 4 mm. and 3 cm. Fine vegetable roots had forced away this coating from the wall of the vessel so that it was only in a few places that it still adhered to the urn. In its thinnest parts the coating was very brittle. The white substance in question has been chemically examined by Dr. G. KARL ALMSTRÖM, Municipal Analyst of Gothenburg. His report is here given:

"Test report No. 15,196.

From the Gothenburg Museum was on May 10th, 1935, handed in a sample of a substance deposited on a clay vessel. The result of the test to which it has been submitted is that it consists of plaster of Paris.

Gothenburg, May 10, 1935.
(sgd.) G. KARL ALMSTRÖM."

I cannot conceive but that this coating of plaster of Paris owes its origin to anything else than an attempt to mend some fracture in the wall of the vessel with this substance. Other instances of mending cracks in vessels in this way will be mentioned below.

Caspinchango.

The dwelling site known as Caspinchango is situated on the southern slope, and near the highest point, of a rise found about 1 kilometre from the right bank of Rio Candelaria. At the site itself the ground had a considerable slope, and between it and the river its incline was still more pronounced. The rise, including the ancient site, was covered with dense forest. Beside the pottery fragments that were found in the ground surface, three funerary urns were also discovered here.

Grave I.

The urn that was first discovered (fig. 44) was prior to its excavation visible as a circle in the ground surface. Of this urn there remained only its lower part, roughly level with the line that in figs. 43 marks the lower edge of the lid. Of the rim of the vessel, or its neck, not even a single fragment could be found. Fragments of the bowl that, upturned, had rested over the urn's mouth as a lid were however found at a fairly shallow depth within the urn, and the fragments of the rim of the bowl were, in the form of a second circle, found in the ground surface outside the one formed

by the wall of the urn itself. It was apparent that rain-water had washed away the greater part of the bottom of the lid as well as the upper part of the urn. On this account the dotted line that in the figure marks the shape of the lid only represents a reconstruction. The earth with which the urn was filled was removed by layers. After the lid fragments already referred to had been found roughly on

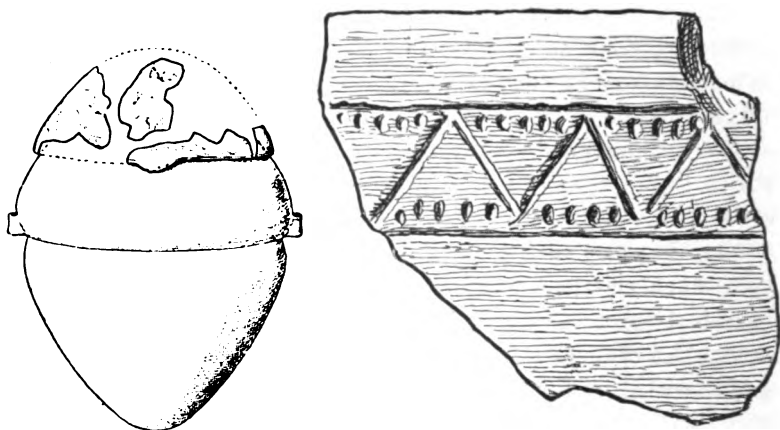


Fig. 43 Sepulchral urn with lid from Caspinchango, La Candelaria, and a fragment of a bowl found in the urn. (G.M. 33.15.723).

a level with the "waist" with which the urn was provided level with the handles, there was removed a layer about 20 cm. deep in which nothing was found. Below this were discovered the first of the bone fragments along with a pottery fragment with incised ornaments, depicted in fig. 43, and in addition a lump of some waxlike substance. The material of the pottery fragment, which originates from a bowl-shaped clay vessel, has a thickness of 6—7 mm., and its sides are shiny black and coated with slip. The second find in this connection, viz. the lump of waxlike substance, has been examined by the municipal analyst of Gothenburg, Dr. G. KARL ALMSTRÖM, who has given the following report:

"Test report No. 14,378.

From the Ethnographical Department of the Gothenburg Museum was on November 17th, 1934, handed in a sample of a waxy substance said to originate from a funerary urn. On examination the sample was found to be entirely unsaponifiable and to consist of paraffin.

Gothenburg, December 5, 1934.
(sgd.) G. KARL ALMSTRÖM."

Paraffin, as we know, is a product of modern industry, and its being found as described inside the funerary urn proves that the latter must have been subjected to excavation at a comparatively recent date. At first it was difficult to explain the presence of the paraffin inside the urn, but since I learnt that candles are manufactured from this material, and renewed examination of the paraffin lump having resulted in the discovery of a wick fragment within it, I think I can give an acceptable explanation of this find. Already prior to its chemical examination it was evident,



Fig. 44. The urn, fig. 43, in course of excavation.

after the earth particles adhering to the paraffin mass had been washed away, that the latter had previously been melted. In its upper part, which was smooth and flat, the wick fragment was subsequently found. Its lower part consisted of a conglomeration of bone fragments, earth and paraffin, and in its centre could be seen a projection of paraffin which evidently constituted the butt end of a candle.

Probably some mestizo once came upon the urn, and then scooped the soil out of it to such a depth as to discover the bone fragments from the individual buried in the urn. That these had partly been left undisturbed is apparent from the fact that immediately below the mass of paraffin the bones of a human foot were found which had not been disarranged. When the early excavator had got as far as this he supposedly ceased operations from superstitious fear of the dead, and, as a kind of offering, placed a burning candle inside the urn. The candle was left to burn down, thus forming the molten mass, soil was by rain-water washed into the urn, so that it became filled again, and along with the soil also pieces of the lid as well as the pottery fragment with incised ornamentation. The lid fragment must have been the last to subside into the urn, although before the urn had been filled up to the level of the surrounding ground surface. The material of the lid fragment is about 1 cm. thick, and at the edge somewhat thicker. Two fragments of this are provided with rim bosses. These were no doubt originally placed opposite each other. They are impressed with grooves running across the edge of the rim. The surfaces of the lid fragments are of a reddish brown colour, and especially on the outer side of the bowl striation marks from the maize cob used in finally polishing the bowl are discernible. Lids of this description are, however, usually given a slip-finish on their inner side. The material of the urn itself has a thickness of about 5 mm., but this increases by a millimetre or so towards the bottom. It is of a finer quality than that of the lid. On the surface the urn, like the lid, is of a reddish brown colour, but striation is absent, slip-finishing having instead been applied as regards the outer side. In its widest part the urn has a diameter of 90 cm. The skeletal remains contained in this urn were those of a comparatively young, strongly built individual.

Grave 2.

30 m. east of the foregoing, two more funerary urns were discovered. One of them came to be among the finds that were completely destroyed by fire while being transported from La Candelaria. This urn, as well as its lid, was already when discovered badly damaged by the roots of an adjacent shrub, and earth-pressure had flattened down the urn from above. As regards shape and material it was very similar to the preceding find. At its widest part it measured 90 cm. across, and the height of the portion in situ was 60 cm. In this case, too, the shape of the bowl, i. e. the lid, could not be ascertained. Among the skeletal remains that filled the urn up to a height of 20 cm. from the bottom, was a skull. In the soil outside the urn fragments were found of a bowl with incised ornaments, and in the soil within the urn remains of charred wood were found. It may be mentioned that the walls of the urn had cracked in places so as to form bands 5—7 cm. in width, as in the case of urn from grave 2, of El Quebrachal. The skeletal remains that were discovered show that in the urn had been buried an adult individual of uncommonly strong build (G. M. 33.15.748). A couple of the teeth bear traces of caries. The frontal region of the skull, which was in a comparatively good state of preservation, appears, judging from its shape, to have been deformed by pressure applied to the forehead.

Grave 3. (Fig. 45).

In the immediate vicinity of the find just dealt with a second urn was discovered. The distance between the two finds was only 30 cm., but the latter urn was however at a lower level than the preceding one. Whether the two urns had been deposited in the same pit could not be ascertained. If these burials were not simultaneous, the position of the one here dealt with points to its greater age. This urn is larger than any other urn I know of from La Candelaria. From Pampa Grande a vessel of similar size is depicted by

AMBROSETTI (4, p. 43). Our urn, seen in fig. 45, measures 140 cm. in height, and together with the lid, 165 cm. In shape it does not very much differ from the other two urns from Caspinchango described above. The only difference would be that in the urn we are here concerned with the upper portion is greater in diameter than the lower. In its waist are two handles, oppositely placed. When first discovered, fragments of the lid and the neck of the urn were found scattered about. Only a few portions of the lid are missing. The neck portion, on the other hand, was very incomplete. Only about one-half of the rim was discovered, and of all the fragments that would have established a connection between it and the body of the vessel, only one was found. This circumstance points to this grave being the older one, and that it was in part uncovered and damaged when the next burial (grave 2) took place. The neck, such as it appears in fig. 45, has thus been reconstructed on the basis of the general shape of the vessel and the neck fragment discovered. As will be seen from the figure, the neck is provided with ornamentation consisting of a number of incised, parallel zigzag lines. In the region where this ornamentation was applied, the wall of the vessel was, however, so thin that it was necessary to increase its thickness by adding a layer of clay to the outer side of the neck. The bottom edge of this layer is marked by a ledge in the wall of the vessel, 2 mm. in height. Below this ledge the material is thinner. In spite of this added thickness, the incised lines nevertheless appear as raised ridges on the inner side of the wall. When excavated, the urn had a number of cracks running across it, but in spite of this the fragments were found to have fairly well retained their positions in relation to each other. The portion found in situ had a height of 110 cm., that is to say, it was preserved roughly up to the level on the ledge just below the neck referred to above. Through the bottom of the urn has been knocked a hole with a diameter of a few centimetres. The material



Fig. 45. Sepulchral urn with lid from Caspinchango. La Candelaria.
(G.M. 33.15.724).

of this urn is remarkably thin in proportion to the size of the vessel. The wall is mostly only 5 mm. thick, the bottom portion, however, being 8 mm. The outer side is of a brownish colour, and evidently finished with slip. The material of the lid has a thickness of one centimetre, and its outer

side is, as usual, striated. The heart of the material is blackish grey. The lid is provided with oppositely placed crescent-shaped ridge handles on its outer side and immediately below the rim. The shape of the handles is seen in fig. 110, *f*.

The skeletal remains discovered in this urn showed that in it had been buried an adult individual of fairly mature age. In one or two teeth traces of incipient caries could be observed.

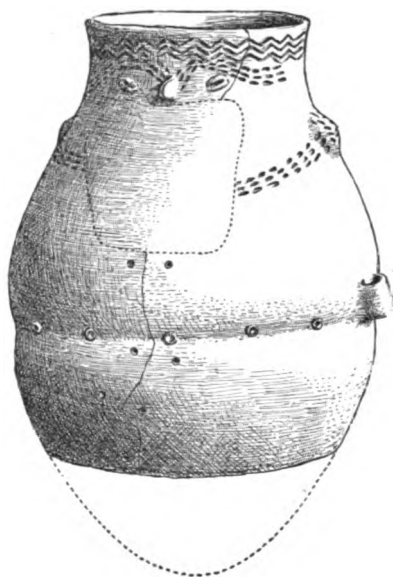


Fig. 46. Anthropomorphic sepulchral urn from an archaeological site near Aranda. (G.M. 33.15.651).

On the other side of Rio Candelaria, roughly opposite Caspinchango and at about the same distance from the river, there is another ancient site, the name of which I do not know. After having completed the excavations I had planned in La Candelaria, I happened to make a brief visit to this site, and then had the opportunity of excavating the anthropomorphic urn depicted in fig. 46. When discovered, the urn was lying with its rim close to the ground surface, but it had tilted to one side so that it could not with certainty be ascertained in what direction its face had originally been set. Either of two points of the compass, viz. east or south, may here have been possible. If the face of the urn had been turned towards the east, this would have conformed to the anthropomorphic funerary urns that BOMAN (I, vol. II, p. 840, or 3, p. 9) excavated at Arroyo del Medio. It may perhaps also be mentioned here that the skeletons

discovered by LAFONE QUEVEDO (3, p. 358) in funerary urns at Chañar Yaco had their faces turned towards the north or east. As regards the La Candelaria finds I have had no opportunity to make observations on similar lines.

In the urn we are here concerned with no finds were made. Its bottom was altogether missing, and so was the portion where the mouth ought to have been, judging from the remaining parts of the anthropomorphous ornamentation. It should be mentioned that I was not given the opportunity of completing the excavation of this urn, and therefore must base my account of it on information supplied me by those finished the work. The material of the vessel is one centimetre thick, and of blackish grey colour. The outside has been finished with slip. Just below the rim of the mouth can be seen a triple, incised zigzag line, that is to say the typical ornamentation of funerary urns in La Candelaria. Below this, on one side of the vessel, is found the anthropomorphous ornamentation. What is left of it consists of nose and eyes, executed in relief. The eyebrows are represented by a treble line of dots. The arms are similarly indicated, and the shoulders (woman's breasts?) suggested by two slight bulges in the wall of the vessel. As will appear from the picture, the hands probably touched the mouth, a detail of marked correspondence with the numerous funerary urns for children that have been discovered in the Calchaqui valley. Level with the handles, the waist of the vessel is slightly incurving. In the waist has been applied a row of small, annular, wart-like protuberances, produced by pressing with the finger pellets of clay against the wall of the vessel, the clay of the pellet then being raised, crater-like, about the tip of the finger. This method of decoration bears a certain degree of resemblance to that seen on an urn found by AMBROSETTI (4, fig. 68) at Pampa Grande, in the Salta province. In the latter case, however, instead of clay pellets a damp

roll of clay with indentations from the finger-tip had been attached so as to form a circle round the vessel in its waist. This method also occurs in La Candelaria, as is apparent from the fragment, fig. 111, *p*. It is also known from the province of Santiago de Estero (EMILE and DUNCAN WAGNER, pl. XII). As will be seen from the picture (fig. 46). in the wall of the vessel is a crack which has been mended by the method mentioned above, that is by boring holes on either side of the crack, and by drawing this together by means

of string passed through the holes (cf. p. 59). The holes are bored from the outer side. The height of the preserved portion of the urn is 90 cm. Anthropomorphic burial urns are not common in La Candelaria. I only know of one more, namely the exceedingly beautiful urn discovered by SCHREITER (1, pl. I, fig. 1) at Santa Barbara.

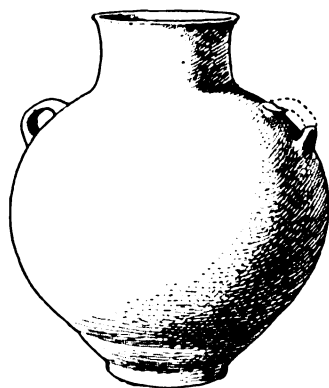


Fig. 47. Clay vessel from Angosto, La Candelaria. (G.M. 33.15.705).

Angosto.

Having heard that funerary urns had been found at Angosto, a small homestead situated near the right bank of Rio Candelaria, at the point where the road to Ruiz de los Llanos leaves the river, I went to visit the place. The finds were said to have been discovered close to, and within, the steep right-hand bank of the river. My visit did not, however, produce any other result than to give me the opportunity of purchasing the clay vessel seen in fig. 47, which was stated to have originated in this place. The natives were using it as a water jar, in La Candelaria a not uncommon use for vessels found in the ground. A crack in its wall had been provisionally mended by its possessor by the expedient of tying a piece of rawhide tightly round the vessel. As can

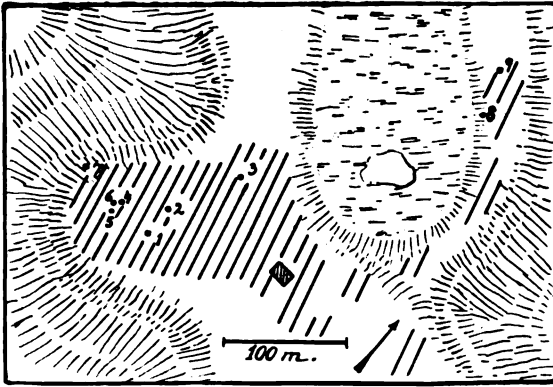


Fig. 48. Sketch map of the Huancaocha site, La Candelaria. The shaded area marks the approximate area of the ancient Indian settlement. The square denotes a modern house.

be seen from the figure, the vessel is practically spherical, with an even curve from bottom to neck except for a minor incurvation just above the bottom. This incurvation may possibly owe its presence to the method used in the making of the vessel. In our days when a clay vessel is made in La Candelaria — at which no potter's wheel is used (cf. chap. XI) — the bottom portion is first shaped from a lump of clay. The upper edge of this bottom slab is no doubt identical with the step running round the lower portion of the vessel. In the upper part the material is about 5 mm. thick, and its colour on the outer side greyish brown, on the inner side darker, almost grey-black. The bottom is flat, and the height of the vessel is 40 cm. I am told that no skeletal or other remains were found in association with this find.

Huanacocha.

At this site the ground was unusually open. It consisted of a low and flat-topped rise, in a northwest-southeast orientation. A narrower and lower offset from it runs in a northerly direction (sketch map, fig. 48). The area included in the rise and its offset consisted of very swampy ground, there



Fig. 49. Huanacocha. View from the west.

was even a large pool of water in one spot, and thus it seems probable that in dry seasons the former population had a natural water reservoir here. A couple of solitary trees growing about a deserted dwelling house on the highest point of the main ridge (fig. 49) formed the only vegetation found there. Its northern spur, on the other hand, was sparsely wooded, while the surrounding plain was covered with denser forest, which, however, did not ascend higher than to a couple of metres' elevation on the slopes of the rise. In no direction were these inclines of such steepness as to be of help to the defenders of the site in case of attack. Although from the crest of the ridge, to which the settlement had been centred, it was possible to survey the entire surroundings, the elevated position of the ancient village would not have been of any particular advantage for keeping a lookout in view of the wooded character of the environs. The scattered surface finds of pottery fragments were most numerous on the highest point of the ridge, and, judging by their distribution, the settlement had been concentrated to the treeless crest, in particular to the portion of it lying south-west of the water-filled hollow, in the widest part of the ridge. Detached finds occurred very sparsely on the northern spur of the ridge.



Fig. 50. Grave 1. Huanacocha.

At this site there were in all discovered and excavated nine graves (marked 1—9 on sketchmap, fig. 48), seven of which were situated on the main ridge and two on the western slope of the north-running spur. It may be mentioned that all the funerary urns from the main ridge were of small size, while those from the spur were considerably larger.

Grave 1. (Figs. 50 and 51).

As will be apparent from fig. 50, this urn was very superficially placed, and on that account much damaged by the flow of rain-water. Only a single small fragment of the rim was discovered in the soil that filled the urn. It has not, however, been possible to fit this fragment into its place in relation to the portion of the urn found in situ, and thus the original height of the vessel cannot be ascertained (fig. 51). The height of the urn as discovered in situ was 45 cm. Its walls are about 5 mm. thick, but increase in thickness

by a millimetre or so towards the bottom, which is flat, and has a rough surface, unlike the rest of the outer side of the vessel which is slip-finished. On the lower part of the vessel impressions from the shelled maize cob used in polishing it can be noticed. On the preserved neck portion are

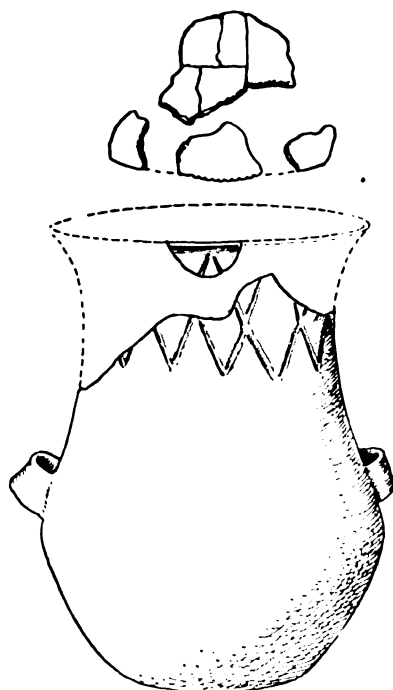


Fig. 51. The urn from grave 1 and fragments from the lid. Hu-anacocha. (G.M. 33.15.726).

remains of incised ornamentation consisting of two zigzag lines one above the other so that a series of rhombic fields has been produced forming a connected band running round the neck. In the earth with which the urn was filled a number of fragments, not of the urn, were found. Some of these fragments have subsequently been fitted together, including two of which a portion of the rim formed part, one of these also bearing a rim boss (fig. 51). Since all the fragments evidently originated from one and the same vessel, probably a bowl, it may be

inferred that the urn was provided with a bowl-shaped lid. On the rim-boss are found a number of grooves running across the edge of the rim.

Grave 2. (Figs. 52 and 53).

This consisted of a funerary urn worn away by the flow of rain-water to such an extent that only the lower portion up to the level of the handles remained in situ (fig. 53). Up



Fig. 52. Grave 2, Huanacocha, seen from the south.

to its highest point it measures only 30 cm. In the upper part the material has a thickness of 8 mm., increasing by about 1 mm. towards the bottom, which is flat. The outer side of the bottom is very rugged. Higher up, in a few places the original wall of the vessel lies bare, free from the calcareous deposit collected on it during the time it was embedded in the soil. In these places the surface is of a beautiful reddish-brown colour and exceedingly smooth, owing to its having been treated with slip. The inner side of the wall shows striated marks from polishing with a shelled maize cob. A couple of fragments found in the earth contained in the urn were ornamented with two parallel rows of shallow pitted depressions, probably remains of the

design with which the neck of the vessel originally was decorated (fig. 53). As will be seen from fig. 52, four stones set on their edges were discovered north of the funerary urn. They were arranged in a semicircle, at a distance from the urn of 40 cm. The diameter of this semicircle was 60 cm. (cf. fig. 52). The height of the largest stone was 30 cm.

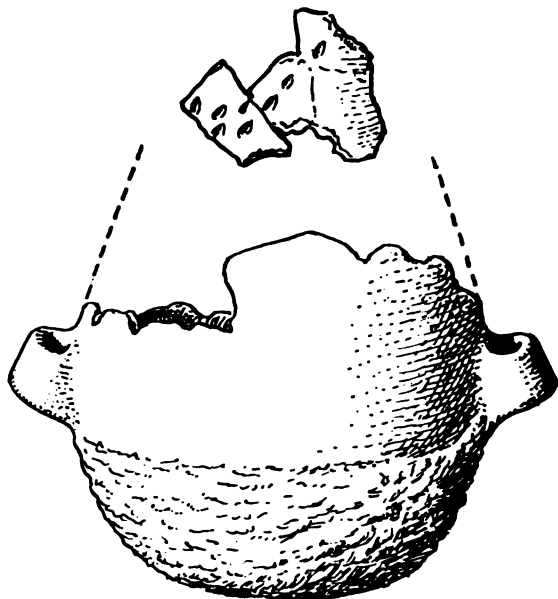


Fig. 53. The urn from grave 2, Huanacocha. (G.M.33.15.727).

Similar stone arrangements are mentioned by AMBROSETTI (4, p. 30) from his researches in Pampa Grande. On the ground surface was found the stone adze illustrated in fig. 122, *a*.

Grave 3. (Figs. 54 and 55).

In spite of its situation close to the ground surface this funerary urn was practically intact. Thus there was only a small portion of the rim missing. Whether this vessel had been covered with a bowl-shaped lid cannot with cer-



Fig. 54. Grave 3, Huanacocha, during excavation.

tainty be determined. A couple of pottery fragments were actually found in a position so close to the rim of the urn's mouth that they might be suspected of being the remains of a lid (fig. 54), but as neither of these fragments consists of a rim portion, nor can be shown to have belonged to the same piece although found lying edge to edge, it is more probable that their relative position had been adventitiously brought about by the flow of rain-water. The urn is 30 cm. high, and its material is of grey colour and one centimetre in thickness. On the outside the vessel is not so finely polished as the rest of the Huanacocha urns dealt with below. Particularly its bottom, which is rounded, has a rather rough surface. Below the rim is seen the usual ornamental design, namely a pair of zigzag lines, in this case, however, so lightly drawn as to be discernible only with some difficulty.

In the sepulchral urn a small number of bone fragments

were found (fig. 148). As will be apparent from the examination that Professor J. VILH. HULTKRANTZ, of Uppsala University, has kindly carried out of this skeletal material (see Appendix I, find G.M. 33.15.728), these bones are those of a foetus in the sixth embryonic month. Whether this be a case of miscarriage or abortion, is naturally impossible to determine. In the following I shall to discuss the possibility of the Lule-Tonocote Indians, mentioned by Lozano and Machoni,



Fig. 55. The urn from grave 3, Huancocha. (G.M. 33.15.728).

having been the exponents of the culture that is represented by the archaeological finds here dealt with. In such a case it should therefore be pointed out that LOZANO (I, p. 101) mentions abortion as having been practised among the Lule-Tonocote Indians. On this matter he says: «Si alguna muger antes de casarse, concibe, mata la criatura, ò antes de parir, ò despues del parto, sin que esta sea nota, ò infamia por la qual

no sea admitida, y aun pretendida para muger.» Even in our days abortion is practised by Indians on the Pilcomayo (NORDENSKIÖLD, 18, p. 38), and this correspondence between the Lule-Tonocote Indians mentioned by Lozano and Machoni, and the Chaco tribes — as well as several other parallels which will be adduced in the following — forms a justification for classing the Lule-Tonocote Indians among the Chaco tribes on the basis of the culture they possessed in the beginning of the 18th century.



Fig. 56. Graves 4, 6, 5, Huanacocha, seen from the east.

Graves 4, 5 and 6.

These funerary urns were discovered more or less simultaneously. Their relative positions will be seen from the sketch map, fig. 48, and from fig. 56. Owing to their superficial situations they had all been badly damaged by flowing rain-water.

Grave 4. (Fig. 57).

The defective lower portion of this urn, as discovered in situ, measured 35 cm. in height, and, as will be seen from fig. 57, showed it to be of a shape considerably divergent from that of the rest. Thus, as to shape, it presents a great deal of resemblance to one of the funerary urns that AMBROSETTI (4, fig. 60) discovered at Pampa Grande. Its bottom is similarly pointed, and, as will be apparent from the figure, the body above the handles curved strongly inwards. In the upper portion the material is about one centimetre in thickness, which increases slightly towards the bottom. In colour it is brown and brick-like. In places where the clay material is free from a thick, calcareous coating — here,

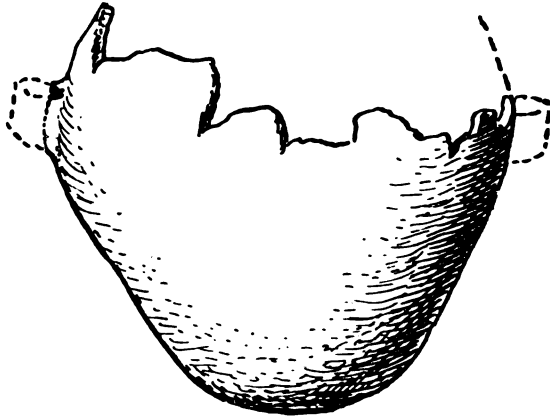


Fig. 57. The urn from grave 4, Huanacocha. (G.M. 33.15.729).

as in so many other cases, deposited on the outer wall from lengthy contact with the surrounding soil — the surfaces are seen to be brownish red, and smooth, evidently from having been finished with slip. In places the bottom is remarkably rough.

Grave 5.

Of this funerary urn (G. M. 33. 15. 730) nothing but the bottom was left. The under side of this is very rugged, and its shape resembles that of the bottom portion of the urn in fig. 53. The thickness of this bottom portion is about 1 cm., while in the remaining fragments of the walls the material is 8 mm. thick. A few fragments of the neck and rim of the vessel were found in the soil contained in the urn, near its bottom. One or two of these fragments bore traces of the usual ornamental design, viz. a parallel pair of zigzag lines.

Grave 6. (Fig. 58).

Of the three urns that were found together, this is the one best preserved. In this case one side of the lower por-

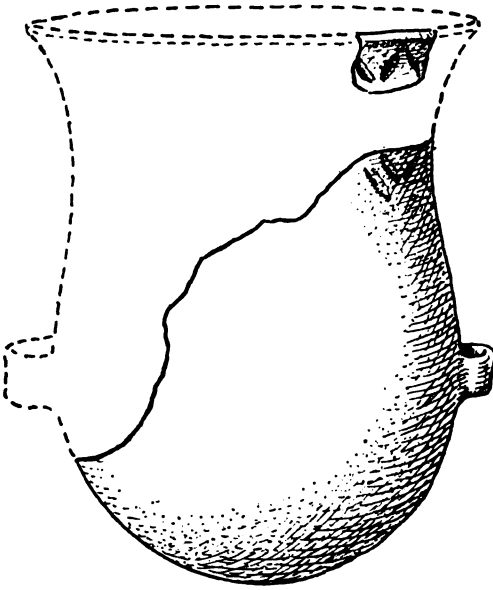


Fig. 58. The urn from grave 6, Huanacocha. (G.M. 33.15.731).

tion discovered in situ is intact right up to the part of the neck where the ornamentation is found, consisting of lightly incised, parallel zigzag lines. A small fragment of the rim was found in the earth with which the urn was filled. It has not however been possible to fit this fragment to the portion found in situ, and therefore the exact height of the urn cannot be ascertained. The portion found in situ has a height of 40 cm. The bottom is rounded. The material is very nearly 1 cm. thick, and of a brown, granulated and brick-like texture. The outer side of the bottom is somewhat rugged, while the sides are smooth, having probably been slip-finished. The proper colour of the surface, in places where it is free from the calcareous coating deposited through being buried in the soil, is light-brown.



Fig. 59. Grave 8, Huanacocha, during excavation.

Grave 7.

This grave consisted only of a collection of pottery fragments (G. M. 33. 15. 733) which were found scattered over a space measuring about 50 cm. across, and to a depth down to 15 cm. Although these fragments were all of the same vessel, this, however, proved impossible of reconstruction as too many pieces were missing. Two of the fragments are provided with handles, while two others have bulges measuring 5 cm. in diameter, and it therefore seems that the vessel in question belonged to a certain group that will be jointly discussed below (p. 139 and foll.). The material of the fragments is 1 cm. thick, and of a brown colour. The outer side is finished with a light-brown coating of slip.



Fig. 60. The same grave as that in fig. 59 during a more advanced stage of excavation.

The two following funerary urns were discovered in the northern spur of the main ridge, and, as already mentioned, are considerably larger than those described above.

Grave 8. (Figs. 59—61).

This funerary urn is unfortunately one of those which were irretrievably damaged by the accidental fire which destroyed a large proportion of my collections in their transportation. For its description I therefore depend exclusively on the photographs taken, and the observations noted down, at its excavation.

When discovered, the urn measured 1 m. in height, although it was originally higher, seeing that the rim portion was missing from the part recovered in situ. As will be

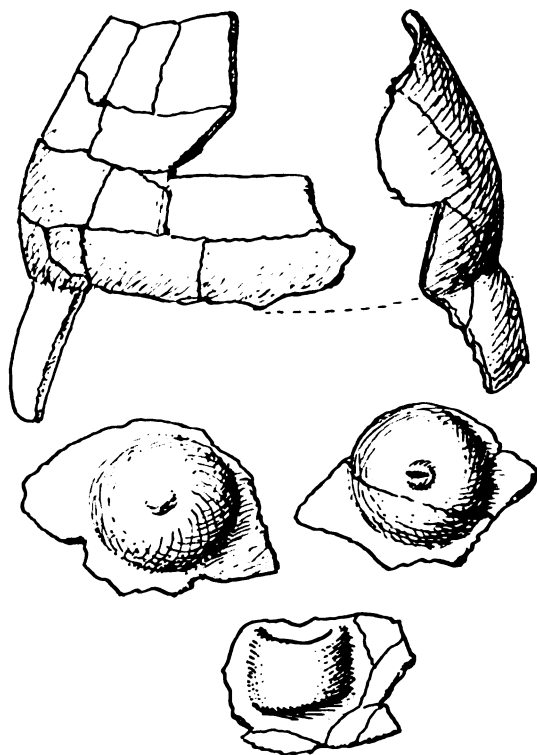


Fig. 61. Fragment of a clay vessel, found outside the urn in grave 8. Huanacocha. (G.M. 33.15.732, a—e).

seen from fig. 60, about half-way up the vessel was slightly narrowing, and this is where the handles had their place. The urn was provided with a lid, a large fragment of which can be seen on the top of it in fig. 59. Outside of the urn were found fragments of two vessels, neither of which, however, was complete (G.M. 33.15.732, a—j). One of these would seem to have been of the same size and shape as the vessel depicted in fig. 39. In these fragments the material was about 5 mm. thick, and of an exceedingly fine quality. The fragments were on the surface grey in colour, and had evidently been given a slip coating. It may be noted that

a hole, about 2 cm. in diameter, had been knocked through its bottom — that is to say, the vessel had been »killed», probably in order to serve as grave equipment. Of the third vessel the fragments are depicted in fig. 61. Judging by them, the vessel appears to have resembled that seen in fig. 81, *a*. The material has a thickness of about 8 mm., and is of a greyish colour. It was originally given a slip coating, but this has come away in places, so that the surfaces are uneven. To this type of vessel I shall recur below. Skeletal remains were found in the bottom part of the urn, consisting of part of a skull, fragments of ribs, as well as a number of teeth, and these indicate that the individual here buried was in the later age of childhood.

Grave 9. (Fig. 62—63).

Prior to being excavated, the rim of the urn was in parts visible in the ground surface. The entire rim circle was, however, missing, and only a fragment of the portion of the vessel that was intermediate between the neck and the more vertically orientated walls was discovered. The urn had been topped by an upturned, bowl-shaped vessel, but this too, had been badly damaged by rain-water. Only two-thirds of its rim could be discovered, and of its bottom practically nothing remained (cf. fig. 63). In fig. 62 part of the bowl — the urn lid — can be seen at the top left, above the funerary urn, the rest of its fragments having been discovered in the earth that filled up the urn. The material of the walls of the latter is about 1 cm. thick, and that of the bottom, on the other hand, 2 cm. It is of a brownish red colour, and, as always is the case in thick material, the fracture surfaces are granulous. The outer surfaces are rugged and show impressions of the shelled maize cob used in polishing them. Besides this the walls of the urn are in parts covered with a calcareous deposit, and the proper colour of the wall only appears in places here and there. This varies from reddish-brown to blue-



Fig. 62. Grave 9, Huanacocha.

black, probably due to uneven heat in the firing. The bowl that was used as a lid is, on the other hand, made of blackish-grey, finely granulated clay material. Its outer surface, in places where visible below the calcareous deposit, is of the same blackish-grey colour. It may be observed that in this case it is the lid that is made from a better quality of clay material while that of the urn itself is of inferior ware. It is usual that bowls used as urn lids are provided with crescent-shaped ridge handles, or rim bosses. In this case, however, the bowl-shaped lid is fitted with a pair of trunnion-shaped handles (fig. 63, *b*), ornamented with two incised lines. Fragments from La Rioja with similar trunnion-shaped handles — one of them even bearing the same ornamentation

as here depicted — are published by BOMAN (2, pl. XXIX, *e* and *f*).

Remains of a third vessel was also found superficially near the large funerary urn (fig. 63, *c*). First a large fragment was discovered including part of a rim and a handle, amounting to almost one-half of the vessel, and later on were found the bottom portion of the same vessel and in

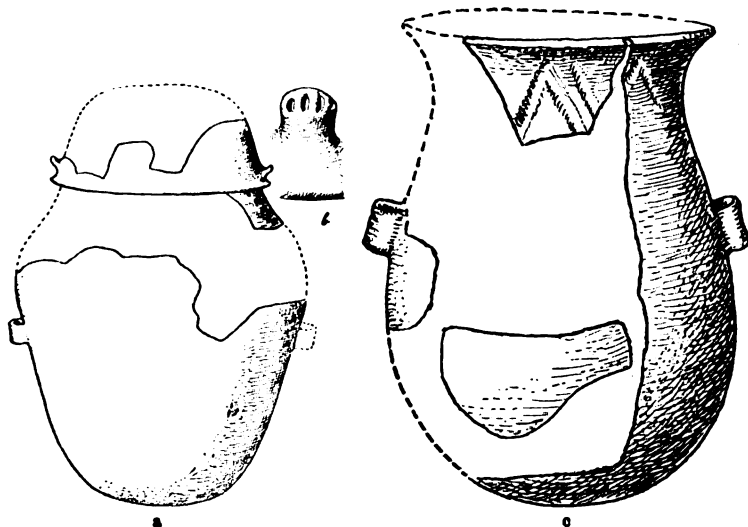


Fig. 63 a—c. Finds from grave 9, Huanacocha. a, sepulchral urn with its lid. b, detail showing the lug-shaped handle of the lid. c, fragmentary vessel found outside the urn. (G.M. 33.15.725, a—c.)

addition a couple of fragments, whereby it was subsequently possible to reconstruct the vessel with a considerable degree of certainty. The height of this vessel is 37 cm. Its material is about 6 mm. thick, its colour is blackish-grey, and its outer surface was probably finished with a coating of slip. Below the edge of the rim was applied the usual ornamentation, the zigzag line.

In the large funerary urn was found the rim portion of a shell (*Strophochilus oblongus*). From this species of shell,

ornaments were made by the Indians of ancient La Candelaria (cf. chap. VII, objects made of shell). The skeletal remains that were recovered inside the urn were those of an adult individual.

It is difficult to determine whether at the ancient site of Huanacocha we have before us two different burial places: one situated on the main ridge where, judging from

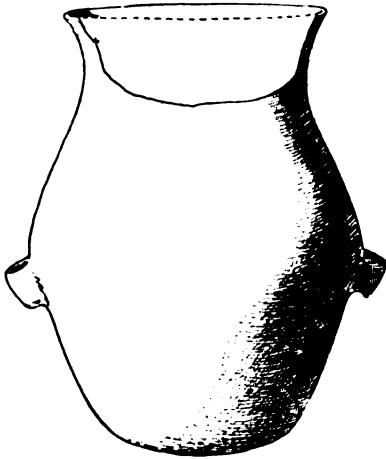


Fig. 64. Sepulchral urn from Huanacocha. (G. M. 33.15.734).

the size of the funerary urns, younger individuals were interred, and another in the north-projecting spur where, from the larger size of the urns, individuals of more mature age were buried. The scantiness of the material does not allow of a definite answer to this question. As has been mentioned, in the excavation of the funerary urn here dealt with, there was found a small clay vessel similar to those discovered in the main ridge. This small vessel may

originate from the burial of a child, and may have been incidentally damaged as the large funerary urn was interred, but it is equally possible — and perhaps more probable — that this vessel, containing food for the deceased, was deposited by the side of the large funerary urn. One of the large sepulchral urns besides, as we know, contained skeletal remains of a comparatively young individual.

From Huanacocha, too, comes the clay vessel depicted in fig. 64. It had been found by the family that formerly was settled on the spot, and used by its finders as a water jar. This vessel was very nearly intact, only a portion of

the rim being missing. The person who sold me the vessel stated that it was found close to the dwelling house on its eastern side, and that no other remains whatever were found along with it. Its height is 55 cm. The material is 1 cm. thick, of grey colour and with a rugged surface, the ruggedness being more pronounced on the outer side of the rounded bottom.

Agua Chica.

As regards grave finds this ancient site was one of the poorest, while detached finds, on the other hand, were numerous. The ancient settlement was situated on a plain where nowadays a few solitary trees and shrubs are growing. The only find worth mentioning from this place consisted of an exceedingly fragmentary funerary urn, in shape resembling that seen in fig. 53. Of this urn (G.M. 33.15.745) not very much was left: only the most bulging portion level with the handles, one of which is missing, and a small fragment of the bottom. On a projecting point of the former can be discerned the usual ornament on the necks of funerary urns, viz. a zigzag line. The material is 1 cm. in thickness, of a brown colour, and on the outer side finished with slip. At its widest part the vessel measures 33 cm. in diameter. The urn, when discovered, consisted of fragments which were scattered over a small area with a diameter of about 50 cm., and superficially disposed. All the fragments were coated with a white calcareous deposit, resulting from long-continued lodging in the soil.

La Puerta.

La Puerta is the name of a «puesto» located at the spot where the road from La Candelaria splits up into two branches, one leading to Santa Lucia and the other to Unquillo.

About a hundred metres southeast of the dwelling house at La Puerta a badly damaged funerary urn was discovered and excavated (fig. 65). This was on a piece of level ground, sparsely grown with shrubs of slightly more than a man's height. These shrubs were generally found each on a slightly

elevated mound, which was due to the roots of the shrub having bound the earth and thus prevented its being washed away by the flow of rain-water. In one of these mounds the clay vessel was discovered.

In situ, only the bottom portion of the vessel to a height of about 30 cm. was found.

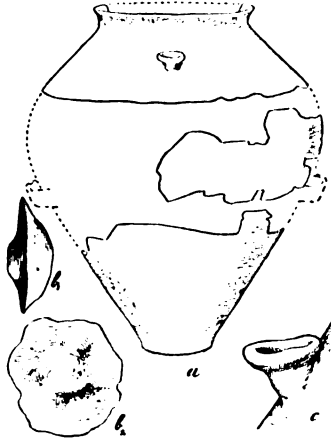


Fig. 65. Sepulchral urn with bowl-shaped projection. The latter is given in detail in c. b, a lump of plaster of Paris which probably has served for stopping a hole in the vessel. La Puerta, La Candelaria. (C.M. 33.15.710).

It was overrun with cracks. The interior of the bottom portion was filled with soil mixed with fragments of the neck and belly of the urn, and in addition there were two lumps of some white and hard substance. Only to a certain degree has it been possible to reconstruct the shape of the vessel. After preservation, all there is of the vessel consists, apart from the bottom portion, of three-quarters of the rim and parts of the wall. No connection can be established between the bottom portion and the rest of the parts, so that the height of the vessel is uncertain. The figure shows

the urn reconstructed in the same way as another urn of similar type, described by AMBROSETTI (3, p. 62). It is here reproduced in fig. 66. On the outer side of the urn, just below the edge of the rim there is a cup-shaped projection (fig. 65, c). Whether a corresponding one existed on the opposite side of the urn cannot be ascertained, as that portion of the urn is missing. The material is 1 cm. thick, and on the outside striated from the shelled maize cob used in its final polishing. The surfaces, and the material itself, are of a brownish colour. The mouth of the vessel has

a diameter of 38 cm., while the diameter of the small cupular depression in the projection 5 cm. and its depth 1 cm. The bottom is flat and remarkably small in proportion to the presumable size of the vessel, being 18 cm. in diameter.

As already mentioned, several cracks ran through the bottom portion. On its outer side, at a spot where four cracks converged, a lump of a hard substance of a whitish

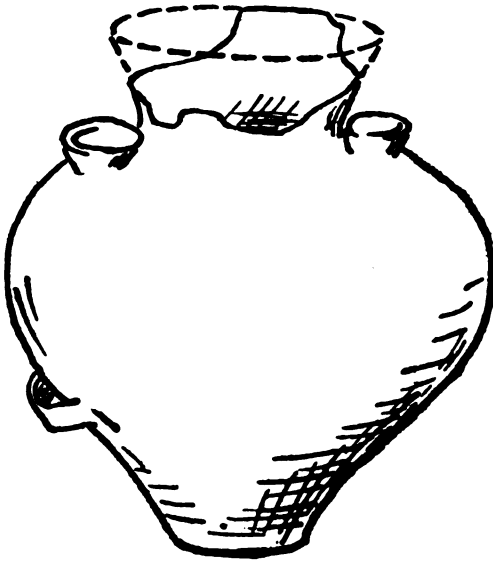


Fig. 66. Sepulchral urn with bowl-shaped projections. Quilmes, Valle de Yocavil. (After AMBROSETTI).

colour (fig. 65, b_1 and b_2) was found. The face that is shown in fig. 65, b_2 was closely applied to the outer wall of the vessel, and in it faint marks from the cracks are discernible. The outer side of the mass was convex, as is seen in fig. 65, b_1 . Two more similar lumps of the same substance were found in the earth contained in the interior of the vessel. The Public Analyst of Gothenburg, Dr. G. KARL, ALMSTRÖM, has examined these finds also and determined them as consisting of plaster of Paris. The shape of the lumps indicates

that they have originally formed part of some semiliquid mass which has set, probably after having been daubed on a fracture in the vessel for the purpose of filling it up. The same procedure, it will be noticed, was found in the case of grave 2 of El Quebrachal (see p. 86).

In the immediate surroundings of the spot where this funerary urn was discovered no traces of settlement could be found — not even a single pottery fragment. The height of this urn appears to have been about 115 cm., and from this measurement an inference may be drawn as to the level of the ground at the time when the burial took place. This level must then have been about 1 m. higher than at present, and thereby the complete absence of stray finds of any kind is explained. One or two small gullies near by may also be supposed to have greatly helped to drain off the flow of rain-water and thus enhanced its destructive force.

I have already mentioned that AMBROSETTI (3, p. 62) in a burial site containing children's funerary urns near Quilmes, in Valle de Yucavil, discovered a funerary urn which shows much resemblance to the one here dealt with. In the Quilmes urn the neck is however more pronounced, and it is in addition provided with a pair of handles, placed just below the widest part of the vessel. Whether the La Candelaria urn had handles cannot be ascertained. The Quilmes urn is described by Ambrosetti as follows:

»Urnas de apéndices cóncavos. — De gran tamaño, un metro á uno veinte, de cuerpo algo piriforme, muy ancho en el medio, con un gollete corto y poco inclinado hácia afuera.

Este tipo de urnas tiene la particularidad de poseer, además de las asas de la misma forma que las otras dos especies de cálices cónicos con la boca dirigida hácia arriba y colocados á ambos lados, debajo del borde y sobre el cuerpo de la tinaja.

Este urna, única también en el primer cementerio, contenía en su interior, otra del tipo Santa Mariano, sin gollete, y dentro de esta hallamos los vestigios del cadáver de un párvulo.

Extraída esta urna incompleta, encontramos debajo de ella y colocado hácia un lado (siempre dentro de la gran urna), un puco negro de pasta ordinaria, con su superficie externa cruzada por rayas irregularmente dispuestas, y de un diámetro de cuarenta centímetros; dentro de éste otro, pequeño puco de seis centímetros de diámetro, bien cocido, de color pardo con una orla en zigzag grabada en su borde.

Las urnas con apéndices cóncavos hállanse frecuentemente en Santa María y San José (mismo Valle de Yucavil) donde he tenido ocasión de ver varios ejemplares.»

From the above description it will be seen that in the Quilmes find not only does the urn show resemblance to the one from La Puerta, but one of the smaller vessels found inside the large urn also presents certain points of correspondence with La Candelaria finds. Thus one of those vessels was ornamented with the incised zigzag line so frequently occurring on the La Candelaria vessels. If the Quilmes find is in some way connected with that of La Candelaria here being dealt with — and that one may well suppose — the value of the former will be enhanced, for within the above-mentioned urn of La Candelaria type was found an urn of Santa Maria type containing skeletal remains of a very young individual. The Quilmes urn thereby dates the La Candelaria find as contemporaneous with the period of the Diaguitan culture when children's sepulchral urns of the above mentioned type were in use. To this I shall recur in chapter X.

In anthropomorphous funerary urns from the Diaguita district it is often seen that the hands of the figure are holding a small bowl up to its mouth. I have mentioned above a vessel from La Candelaria, fig. 46, which in this respect presents certain points of resemblance to the Diaguita vessels just referred to. The purpose served by this vessel, and its significance, is uncertain, but it is not impossible that the presence of the cup-shaped protuberance on the La Candelaria vessel and on the anthropomorphous vessels

of the Diaguita culture served some common purpose, a ritual function.

Lastly, in this connection may be mentioned a small, bowl-shaped vessel which is used among modern Chiriguano Indians (G. M. 15. 1. 90), and provided with a pair of handles. Above the latter, and adjoining the wall of the vessel, on each handle is found a small bowl. Channels through the wall connect the larger vessel with the two bowls.

Santa Lucia.

Some way up the northeastern slope of Loma Colorada lies a puesto known as Santa Lucia. The hillside above it has evidently at some former time been inhabited by Indians. A good many ancient relics had in fact been found in this area, among others the bone objects depicted in fig. 136, *b—c*, which I acquired by purchase. At my visit to the place I only succeeded in collecting a few pottery fragments with incised ornamentation, although on a later occasion I bought a funerary urn said to have been found there (fig. 67). The piece of ground where the settlement had probably been located slopes rapidly down towards the valley, besides which it was traversed by several small gullies which were dry at the time of my visit. This conformation of the ground would tend to explain the present dearth of finds. At the time of the purchase, the above-mentioned urn was intact, but unfortunately was later on badly damaged by fire along with part of my collections while in transit homewards. Its shape is however accurately reproduced in the figure. The height of the vessel is 50 cm., the material being about 7 mm. thick and of a blackish grey colour. Of this colour is also the outer wall, which in its upper part is smoothly slip-finished, but very rugged at the bottom. As will be seen, the urn has a gently incurving waist. Worthy of note is the way in which the handles have been attached. In the wall of the vessel, prior to the firing two holes have been made closely adjoining each

other, and within these have been inserted the ends of the roll of clay from which the handle is formed. The joints have then been stopped up with soft clay. This detail is more fully described below, on p. 193 and foll.

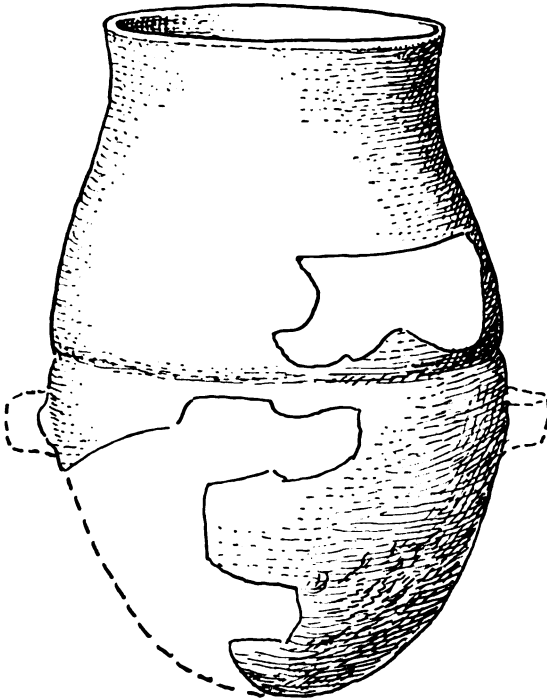


Fig. 67. Sepulchral urn from Sta. Lucia, La Candelaria. (G.M. 33.15.718).

Unquillo.

On the western side, and right at the foot of Sierra Candelaria — the range of hills forming the eastern boundary of the department of La Candelaria — lies a puesto known as Unquillo. In its immediate neighbourhood a number of archaeological remains were discovered. Some 2 kilometres farther along the southern slope of Sierra Candelaria there is another puesto which is also called Unquillo. Another

kilometre farther south an ancient Indian dwelling site, rich in archaeological remains, is to be found. Here and there between the two places just referred to one may be able to pick up a potsherd or two, but the settlement proper appears to have been centred in the abovementioned sites.

The finds that originate from the former of these sites — the more northerly one — were all made in the ground east of the puesto, i. e. just where it begins to rise towards Sierra Candelaria. One kilometre northeast of the puesto there was an area measuring roughly 200 m. each way, within which numerous pottery fragments were discovered. None of these bore any incised ornaments, nor were any fragments of painted vessels, or stone objects, found, all the fragments — which were scattered about on the surface — evidently originating from broken-up funerary urns. The bottom portion of a large sepulchral urn was discovered in situ, and a number of its fragments were found scattered about in its vicinity, but the vessel had, however, suffered damage to such an extent that, after preservation, it proved impossible to reconstruct. In shape it no doubt resembled the large funerary urn depicted in fig. 43, and its material was of a similar character. As already mentioned, the archaeological field was situated some way up the rise towards Sierra Candelaria, although here at the foot of the mountain the gradient was still gentle (fig. 3). The space was grown with shrubs not quite of a man's height, and it was traversed by shallow ravines. It appeared as if the rainflow already had had time to break up and wash away most of the ancient relics of this dwelling site. What was left only consisted of the portions of such funerary urns as had been most deeply sunk into the ground.

About 100 m. south of this relic-bearing area were discovered other ancient remains, viz. the circular stone arrangement seen in fig. 68. This formed an almost complete circle, and was composed of nine stones set on end, as is seen in the figure. The position of one of these stones had prob-

ably been to some extent altered, as the stones were on the whole set in a circle all in contact with each other, while the one just referred to had been forced out of the circle by a strong root. The level of the ground within the circle was somewhat lower than outside it. This interior area was excavated, and it was then seen that deeper down the diameter of the circle was smaller. Above ground it was 90 cm., while below it was only 60. The height of the stones was 55 cm. (fig. 68, *b*). Only two finds were made inside the

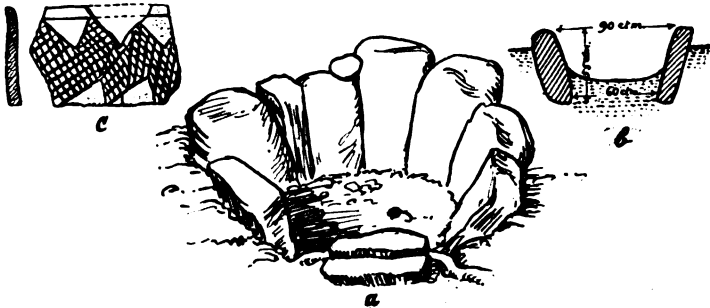


Fig. 68. Circular stone construction at Unquillo, La Candelaria. *b*, its vertical section, and *c*, fragment of a bowl-shaped clay vessel found within the stone construction. (G.M. 33.15.635).

stone circle — the soil within it was of the same consistency as that outside it — viz. a pottery fragment with incised ornaments, apparently from a bowl-shaped clay vessel, and another with striated surfaces, probably originating from a large and bowl-shaped lid of some funerary urn. In the soil immediately below the stone ring no ancient relics were found. After the place had been examined, it was *restored* to its previous state.

What purpose this ring of stones served is uncertain. The remains that were found within it had most probably been carried there by the rainflow, seeing that the soil both inside and outside the stone circle was of the same consistency. This find bears much resemblance to one described by DEBENEDETTI (3, p. 228). In referring to a stone circle

near Camino del Inca, at Callingasta, Debenedetti writes: »En algunas partes, apenas visibles, aparecen rastros borrados casi, de canales o acequias que, al decir de nuestros arrieros, fueron trazados por los antiguos indígenas. A media falda de una de las tantas lomas, un poco alejadas del camino, encontramos un círculo limitado con piedras grandes, bien alineadas. Es de igual naturaleza de los que con tanta frecuencia se encuentran en otras regiones del nordeste Argentino y cuya finalidad no ha sido aún aclarada satisfactoriamente.» In a footnote Debenedetti adds: »Construcciones análogas se han encontrado en Mollar de Tafi, prov. de Tu-



Fig. 69. Circle of stones set round a present-day fireplace in La Candelaria.

cuman, (BRUCH, I, pl. II: 2) en Loma Rica, Ampajango, Quilmes, Fuerte Quemado, Punta de Balasto, etc. En nuestro viaje arqueológico por el valle de Abaucán (Catamarca), en 1911, encontramos numerosas círculos de piedra al norte de Ancillaco, distribuidos al acaso en medio de un monte algarrobos. Las repetidas excavaciones que practicamos dieron resulta negativos.» DEBENEDETTI (2, figs. 8—9) also illustrates two sets of circular stone formations from El Alfarcito, in the province of Jujuy, but they are larger than those here described from Unquillo. It is possible that in the passages cited above, Debenedetti refers to stone formations resembling those of El Alfarcito. Descriptions of ancient Argentine monuments, such as stone circles, are, besides, often very incomplete. AMBROSETTI (4, p. 30) mentions that sepuchral urns in Pampa Grande were surrounded by a circle of stones. It is possible that here we

have before us a stone ring of this type, although the urn itself is no longer to be found within it.

During my stay in La Candelaria, on two different occasions I noticed that around a fireplace in the open a circle of stones, slightly more than decimeter-high, had been built (fig. 69). The diameter of the circles was about 125 cm. These stones had not become brittle from the heat of the fire in the centre of the circle, nor was this the case with the stones of the excavated circle. The only difference between the two stone circles consisted in the stones of the ancient circle being sunk deeply into the ground, while those of the modern one lay on the surface. In the excavated stone circle no ashes or pieces of charred wood were discovered in the enclosed earth, and therefore the above explanation must be accepted with all due reserve.

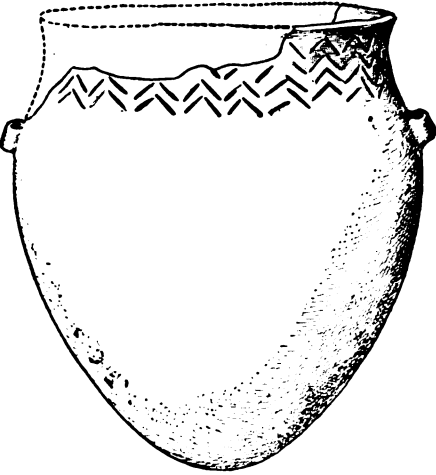


Fig. 70. Sepulchral urn from Unquillo, La Candelaria. (G.M. 33.15.722).

300 m. southeast of the puesto just referred to, a large-sized funerary urn was found in the northern slope of a small hill (fig. 70). Some trees were growing at this spot, but there was no undergrowth. Although no pottery fragments or stone axes were found on the surface of the ground it was nevertheless apparent that the site had for a long period been under settlement, because two grinding stones were discovered adjacent to the funerary urn (fig. 71). From the beginning of the examination the rim of the urn was visible in the ground surface, portions of it having in fact already had time to be washed away by the rainflow. Two fragments that



Fig. 71. The burial urn, fig. 70, during excavation. In the background two grinding stones.

were discovered within the urn point to its having been provided with a lid, especially as their material was exactly similar to that of the lid belonging to the large funerary urn (fig. 43) from Caspinchango. Besides, about half of the soil within the urn had already been washed away by rainflow, or possibly it had been partly emptied by somebody out of curiosity. In its widest part, the material of the urn had a thickness of about 5—7 mm. Here, as elsewhere, it could however be observed that its thickness slightly increased towards the bottom, while in the edge of the rim it measured about 15 mm. The colour of the material, as well as the outside of the walls, was reddish brown. The latter seemed to have been smoothed over with a coating of slip. The customary ornament was found in its upper portion just below the edge of the rim, viz. a number of parallel, incised zigzag lines. And in this case, too, as so often previously, owing to the thinness of the material of the wall this ornamentation correspondingly appeared in the form of ridges on the inner side. In the soil contained in the urn no skeletal remains were found.

The ancient site that was situated about 1 kilometre south

of the more southerly of the puestos named Unquillo proved to be one of the most profitable sites in the whole of the La Candelaria department as regards detached finds. The sketch map, fig. 72, gives an idea of the appearance of the area examined. The site in question was situated some way up the slope of Sierra Candelaria. Thus the settlement was sheltered from the east by the mountain. The entire area was forest-grown, and two ravines traversed it from east to west. At the points marked 1 and 2 on the map, a series of test shafts were sunk in a north-to-south direction, and in these shafts were discovered all the detached finds here .

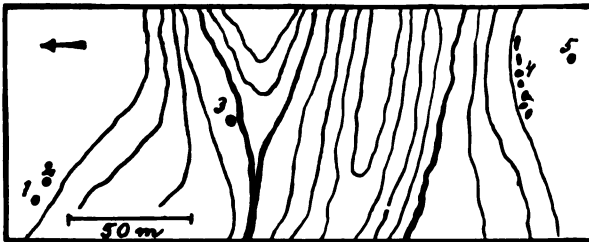


Fig. 72. Sketch map of the southernmost archaeological site at Unquillo.

depicted, with only one or two exceptions. The latter were found in an area lying to the south of the one just referred to. In this latter area very few finds were made. Those which were discovered in the test shafts were never found at a greater depth than 25 cm. They consisted of pottery fragments bearing both incised and painted decoration. Among these fragments was also found the lower jaw of some animal, which the director of the Gothenburg Museum, Ethnographical Dept., Dr. WALTER KAUDERN has determined to have belonged to a llama (cf. Appendix II, find G.M. 33.15.634, *a-b*). The llama, as we know, is a highplateau animal, and present-day climatic conditions prevent its occurrence in La Candelaria. It is possible that in ancient times merchants from the plateau region, bringing llamas with them, came down to La Candelaria to trade with the in-

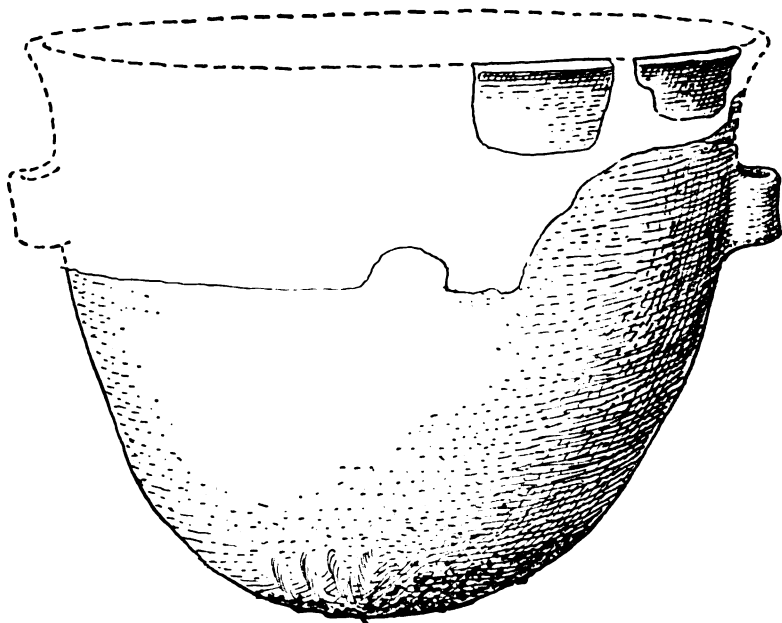


Fig. 73. Sepulchral urn from the southernmost archaeological site at Unquillo. (G.M. 33.15.721).

habitants, and that their animals eventually perished. This supposition would seem to be supported by DEL TECHO's (vol. I, p. 106) statement that the highland Indians of the ancient province of Tucuman were traders to a certain extent, and that in their travels they made use of «una especie de ovejos» (llamas) as pack-animals. It is possible that these plateau Indians traded salt to the Indians of La Candelaria. Besides the finds discovered in the test shafts there were some curious implements of baked clay depicted in fig. 130, and the beautiful fragments of painted earthenware bowls that are seen in fig. 116, *a—b*. The area covered by the test shafts was a partly wooded slope of a low hill.

In the small gully immediately south of this spot was excavated the clay vessel seen in fig. 73. Its exact locality is marked with the figure 3 on the sketch map. Of this vessel



Fig. 74. A collection of grinding stones at the southernmost archaeological site at Unquillo.

only the bottom portion was recovered in situ, the remainder unfortunately already having been washed away by the stream of the gully. Within the soil with which it was filled some sherds of the rim were found. Although these cannot be fitted to the portion that was found in situ, it has, however, been possible with their help to reconstruct the vessel, with practical certainty, in its original shape. The material is 1 cm. thick, and the outer walls are grey in colour. Both inside and outside it has been polished with a shelled maize cob, if one may judge from the striation marks. Close to the bottom portion can be observed finger marks, indicated in the figure, and the bottom itself is remarkably uneven. After reconstruction, the vessel measures 45 cm. in height.

On the tongue between the two gullies, immediately south of this find, a number of grinding stones, depicted in fig. 74, were found. I presume that these are the same as those mentioned by SCHREITER (1, p. 62).

Some 100 m. south of the gully just referred to another gully is found. Unlike the former, at the time of my visit

— which was in the winter, i. e. the dry season — this one was running with a little water. When ascending the southern slope of it, one comes upon a row of stone blocks at the top. This spot is marked 4 on the map. Whether these stones were placed there by nature, or whether they have at some time been thus arranged in a row but disturbed by flood-water from the rains, is difficult to determine. The latter alternative seems however to be more likely. Some

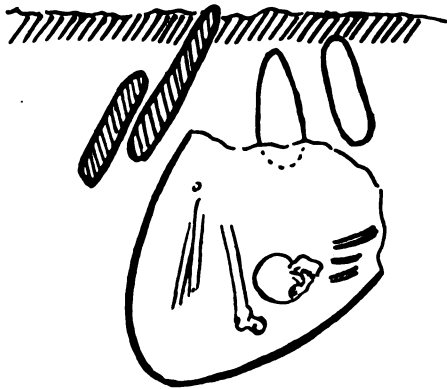


Fig. 75. Vertical section of a grave at Unquillo. Southernmost archaeological site.

10 m. south of these stones a funerary urn was discovered (fig. 75). The spot where this was found is marked 5 on the map. This urn had suffered a great deal of damage, its entire upper portion being missing. It is probable that it had originally been covered with two stones, which are indicated by shading in the figure. Two other stones, the contours of which are in the figure marked with a continuous line, probably constituted the lining of the pit into which the urn was deposited. The bones that were found inside the urn were very much decayed, but the positions of femurs, tibiae and fibulae, the skull, and a number of ribs, could, however, be determined. Evidently the deceased had been buried in a huddled posture. Of this find only the bone

material was collected, as the urn itself was in a too bad state of preservation. As regards its material it corresponded with the urn in fig. 70. The skeletal remains (G. M. 33. 15. 737) prove the buried individual to have been of adult age, although fairly young.

SCHREITER (I, p. 62), who also has carried out researches at Unquillo, relates how he there discovered sepulchral urns containing skeletal remains of children, as well as three urns with bones of adults. The positions of these urns were marked by a row of stones that were partly sunk into the ground, and set in an upright position. Schreiter would seem to have made these discoveries a short distance north of the point on the map (fig. 72) that I have marked with the figure 3. It is possible that the stone array mentioned above served a purpose similar to that of the stones discovered by Schreiter.

Pantanillo,
(*Loma Blanca*).

The situation of the puesto known as Pantanillo in relation to Unquillo will be apparent from the sketch map, fig. 6.

West of the puesto of Pantanillo, at a distance of about one kilometre, there is a low range, or ridge, called *Loma Blanca*. This ridge mainly extends from the northeast to the southwest. Towards the southeast it has an abrupt slope, but it declines gently towards the northwest. The ridge is in the greater part covered with brushwood, and no water supply is found in its immediate neighbourhood.

The portion of the ridge that extends farthest towards the southeast, i. e. its crest adjoining the abrupt southeastern declivity, which has an altitude of about 25 m. above the surrounding ground, shows traces of habitation. Thus, some 30 m. from the top of the declivity is situated the arrangement of stones that is depicted here in fig. 76. It is found in the midst of the thick brushwood.

The stone formation consists of 8 flat stones. Their relative positions will be apparent from the sketch map fig. 77. The large square stone farthest south stood 50 cm. above ground, while it was sunk into it to a depth of 90 cm., and the other large stone, farthest north but one, stood 40 cm. above ground while 70 cm. of it was embedded in the soil. The rest of the stones only projected above ground by a decimetre or so, and were less deeply sunk than the two just referred to. The greatest depth to which any of these stones was embedded only amounted to 30 m., and applies to the obliquely placed stone farthest south but one. The stone blocks were more or less square, and the natural cleavage planes of the rock constituted the large and flat surfaces of the blocks.

As already mentioned, the stone formation was situated some 30 m. from the steep southeastern side of the ridge, that is to say some way down on the gently inclining, north-western slope of the ridge. The ground about the stone formation itself was almost level. West of this, however, the level of the ground was about 25 cm. lower than that east of it. This was due to the stone blocks having prevented the rain water from washing away the soil at the extreme south and north within the formation. The greatest difference in level between these raised portions and the ground east of them was 30 cm., and it is therefore not inconceivable that the stone formation once encompassed a mound of some kind.

Test-diggings were made both east and west of the stone formation to a depth of 1 metre. In the eastern shaft were found two plain pottery fragments consisting of blackish grey and grey-brown material, respectively. On the surface were in addition found two stones of irregular shape. These are marked on the map, fig. 77, by a dotted contour line. It was in close proximity to these stones that the potsherds were discovered. In the shaft west of the stone formation a few stone blocks, similar to those of the formation were



Fig. 76. The stone construction on Loma Blanca at Pantanillo, La Candelaria, seen from northeast. The northernmost block falls outside and to the right of the picture.

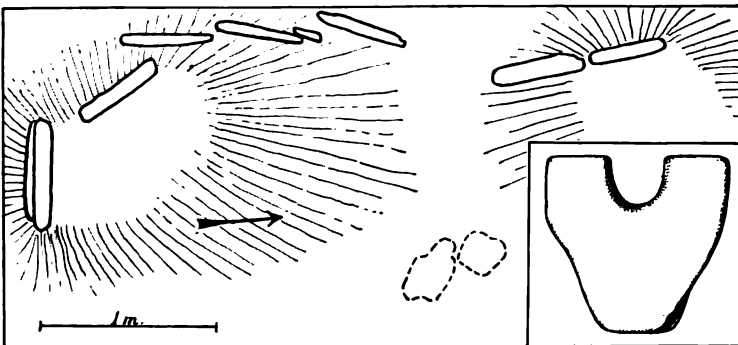


Fig. 77. Plan of the Loma Blanca stone construction. In the right bottom corner a stone with traces of workmanship, which was found near by.

unearthed at a shallow depth. They were lying with their flat sides parallel to the surface of the ground, one being on top of another, but in no apparent order. Having finished the exploration of the spot, I *restored* it to the state in which I had found it.

In the ground between the stone formation and the steep slope in the southeast test shafts were dug in three places, which led to the discovery of a large number of pottery fragments, both plain and ornamented. A number of the latter, with incised decoration, after being preserved have successfully been pieced together so as to give a fairly accurate representation of the shape and ornamentation of the original vessels, as, e. g., fig. 107, / . Some fragments of quartz were also found (fig. 78). Judging from the percussion bulb they seem to have been chipped from a larger piece, possibly in connection with the manufacture of arrow-heads. A number of stone mortars and grinding stones that were found scattered on the ground surface supplied further evidence of the site having been inhabited for a long time.

The stone formation of Loma Blanca, and that already described of Quebrada de la Virgen, may be supposed to have served similar purposes. The former, if one may judge from the stones found below the ground surface, was probably more extensive in its original state than it is now. Probably this stone formation, as well as that of Quebrada de la Virgen, constitutes the remains of a dwelling house in which the floor was sunk below the level of the surrounding ground in order to ensure protection for its occupiers from the chilly winds of the winters. Owing to its position on the top of the ridge this dwelling site must have been much exposed to those bitter winds, but for compensation the steep hillside in the east must at any rate have precluded surprise attacks on the settlement from that direction. As no sepulchral urns were to be found it may be supposed that the stone construction was of a character different

to that of the one mentioned by SCHREITER (I, p. 62) from Unquillo.

A stone formation somewhat resembling the one here described, and which marked a burial-site, was discovered by QUIROGA (2, pp. 97—98) at Anfama, in the Tafi valley, and, judging by the situation of the site, which was south-west of La Candelaria, it is not impossible that it belongs to the same culture as that represented by the finds here dealt with.

The neighbourhood of the stone formation was also subjected to exploration, but although test shafts were sunk at various spots no result was obtained. A further distance

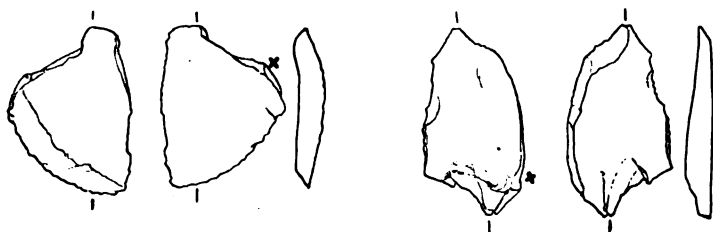


Fig. 78. Chipped stone fragments from Loma Blanca, Pantanillo.
x indicates the bulb of percussion. (G.M. 33.15.606—607).

of some hundred metres down the incline pottery fragments could occasionally be picked up, the wash of the rain-water probably having carried them there. The settlement proper appears, however, to have centred upon a small space of ground situated on the highest point of the ridge, and close to its steep, southeastern edge. In the surroundings could also be seen sporadic blocks of stone, set on edge, similar to those of the above described stone formation although of smaller size. No ancient relics of any kind were found near them. A block of stone that had been worked upon was found 100 m. south of the stone formation. A picture of it is inset in the sketch map, fig. 77. At its widest part it measures 27 cm., its height is 26 cm. and its thickness 5 cm. Like the blocks of the stone formation, this is also from

some kind of rock with plate-like cleavage. The recess seen in its upper, straight edge appeared to have been produced by pounding.

Having been told that 600 m. farther south, on the highest point of the ridge, a clay vessel had been noticed, I went to the spot and located the vessel in question, which probably had served as a funerary urn, fig. 79. It was found near

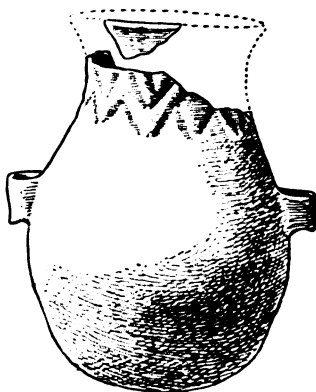


Fig. 79. Sepulchral urn from Loma Blanca, Pantanillo. (G.M.33.15.711).

the southern and less steep slope of the ridge, among some shrubs not quite of a man's height. The vessel had been laid bare by the rush of rain-water, and inquisitive hands had partly emptied it of its contents. In the soil that was left a fragment of its rim was however found. The usual neck ornamentation — parallel zigzag lines — was present, but difficult to make out owing to its shallowness. The number of these zigzag lines cannot be ascertained as it has not been possible

to fit the rim fragment to the urn itself. The outside of the wall of the vessel is greyish brown in colour, and apparently made smooth with a layer of slip. The lower portion of it, as well as the bottom, is however rugged on the outer side. The intact lower portion of the vessel is 33 cm. high, and in its original state its height would probably have been about one decimetre more. In the neck, the material is about 6 mm. thick.

About 1 km. south of the Pantanillo farm further archaeological relics were found. On a small hill, much of the same character as the one depicted in fig. 5, pottery fragments were found scattered about. In one or two places fragments occurred in clusters in the ground-surface. Examination of any such group of fragments almost invariably showed that

two different types of earthenware were represented, viz. that of the thin material of which funerary urns were generally made, and that of considerably greater thickness, with one surface — the outer one — carrying striation marks. The latter category of earthenware is the one usually occurring in sepulchral urn lids. These fragment groups apparently derive from lidded sepulchral urns that have been washed out of the ground by rain water and then burst asunder by pressure from the soil filling their interior. One sepulchral urn had, however, escaped destruction in this way (fig. 80). It was discovered in the southern slope of the hill. When first seen it was half visible within a wall of earth which had withstood the rush of water from the top of the hill. It was still half filled with soil. The lower portion of it was in an exceedingly advanced state of erosion, and fragile, and the bottom, which probably had been egg-shaped, could not be distinguished from the surrounding soil.

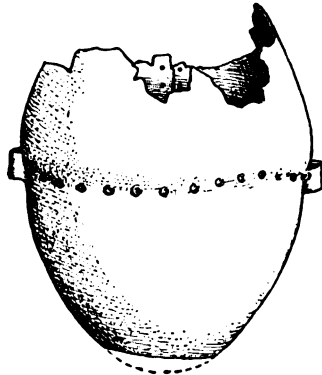


Fig. 80. Sepulchral urn from Pantanillo, La Candelaria. (G.M. 33.15.719).

No finds of any kind were made in the earth contained in the urn, not even a potsherd to indicate that the vessel had been provided with a lid. Level with the handles, the body of the urn shows a shallow-curving waist. In this there are a series of annular, wart-like projections resembling those on the funerary urn in fig. 46. The vessel, as will be seen, has a crack which has been mended by boring holes on either side of it, a method here already described. The walls of the vessel are blackish grey, and smooth, particularly on the outer side where — as often is the case — they have been finished with slip. Their thickness amounts to 7 mm. As illustrated in fig. 80 the vessel has a height of 90 cm.

III.

Clay vessels from La Candelaria, not used as sepulchral urns.

Owing to skeletal remains being apt to disintegrate rapidly and vanish even in cases of burial within a clay vessel, it is often difficult to determine whether a given vessel, found in the ground, is to be classed as a funerary urn or not. Where a vessel unassociated with such remains is discovered, its shape, sepulchral offerings deposited within it, etc., will afford clues to its determination. In the ancient sites, however, are occasionally found large-sized vessels that cannot possibly have been employed as sepulchral urns, seeing that the diameter of the mouth is so small as not to admit a newborn child or even a foetus. There are also occasionally found in sepulchral urns, or on the ground surface, small bowl-shaped clay vessels, or vessels of zoomorphic or anthropomorphous shape. In the foregoing I have dealt with sepulchral urns, and below I shall dissert upon such clay vessels as cannot possibly have been used as sepulchral urns.

All of the pottery finds that are here dealt with consist of greyish ware; those which are of brick-like ware, and provided with incised or painted ornamentation will be discussed in another section of this paper.

Anyone studying the archaeological clay vessels from La Candelaria that form the subject of this treatise must as a first impression be struck with their great variety of form. This abundance of types and forms makes it difficult to

divide the material into different groups, and the classification made in the following has for its main purpose a better survey of the material.

Clay vessels with bulges.

In the collection from La Candelaria possessed by the Tucuman University Museum there are two earthenware vessels of this description which were discovered and excavated in the Cuchiyaco site by Professor A. MÉTRAUX in the course of his visit to La Candelaria referred to above. The collection in question has been published by me in a brief and very summary essay (RYDÉN, 1). In this publication the vessels in question are illustrated in fig. 1, d—e, and in the present essay they are seen in fig. 81, *a—b*. Typical of these vessels are the exceedingly narrow necks, which precludes their having been used as sepulchral urns, their pointed bottoms, and the bulges on the walls, above and below. From the shape of these large bulges below SCHREITER (1, fig. 17: 2 and 3) has found it suitable to refer to this type of vessel as »Jars avec proéminences en forme de seins». On one of these vessels, fig. 81, *a*, two small bulges are seen though only one of them is intact, placed opposite each other on the upper portion of the neck of the vessel, and two larger ones below the handles. Both of the latter bulges are placed on the same side of the vessel, which is thus of asymmetrical shape. The vessel denoted as *b* in the same figure lacks the two upper bulges. This probably got broken off at the same time as the neck of the vessel. It is provided with four large ones symmetrically arranged lower down the vessel, level with the handles. It is in addition provided with a waist. In both vessels the neck is ornamented with impressed dots and lines, but the original appearance of this decoration cannot be ascertained as in both cases the upper part of the neck, as well as the edge of the rim, is missing. There is, however, published by SCHREITER (1, fig. 17: 2) a complete clay vessel of this type, which, in conjunction with the above-

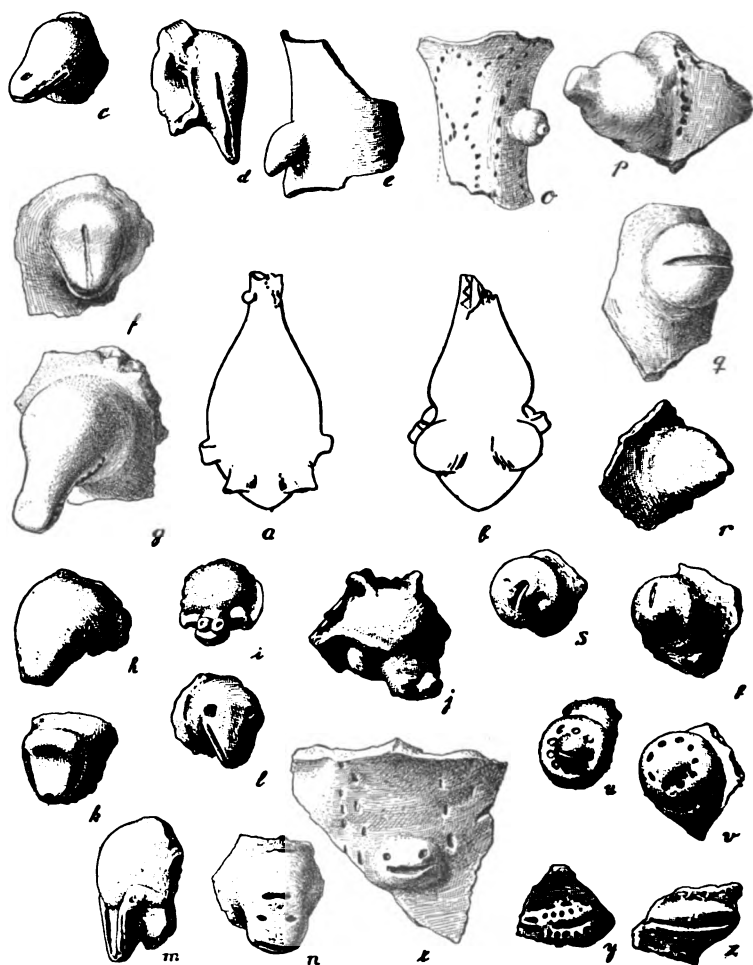


Fig. 81. a. Clay vessel. Cuchiyaco, (U. M. o. T.), b. Clay vessel. Cuchiyaco, (U. M. o. T.), c. Huanacocha, (G.M. 33.15.534), d. Sta. Barbara, (G.M. 33.15.336), e. Unquillo, (G.M. 33.15.617), f. Agua Dita, (G.M. 33.15.348), g. Huanacocha, (G.M. 33.15.536), h. Cuchiyaco, (G.M. 33.15.247), i. Agua Dita, (G.M. 33.15.345), j. Unquillo, (G.M. 33.15.454), k. Cuchiyaco, (G.M. 33.15.246), l. Unquillo, (G.M. 33.15.453), m. La Candelaria, (G.M. 33.15.685), n. Unquillo, (G.M. 33.15.618), o. Unquillo, (G.M. 33.15.616), p. Cuchiyaco, (G.M. 33.15.251), q. Sta. Lucia, (G.M. 33.15.510), r. Sta. Lucia, (G.M. 33.15.511), s. Cuchiyaco, (G.M. 33.15.257), t. Cuchiyaco, (G.M. 33.15.252), u. Agua Dita, (G.M. 33.15.347),

mentioned vessels of the Tucuman museum, has made possible the identification of a number of fragments as originating from the upper portions of vessels resembling those which have here just been dealt with. These fragments are here illustrated in fig. 81. All of these fragments appear to consist of greyblack material, with the outer side slip-finished. In addition to the complete clay vessel mentioned above, SCHREITER (I, fig. 17: 3) depicts another one of similar type. The exact locality in La Candelaria where these two vessels were discovered is not stated. The first-mentioned better preserved one approximately resembles the vessel seen here in fig. 81, *a*, the only difference being that it lacks the two bulges on the neck as well as the incised ornamentation that is usually found on the necks of these vessels. The second vessel depicted by SCHREITER (I, fig. 17: 3) also has two large bulges in the lower part of its body. As in the foregoing case they are placed on the same side of the vessel, but level with the handles and are, besides, of more rounded shape. The edge of the rim is missing on this vessel, but there is, however, enough left of the neck to show that it was ornamented with a double zigzag line, such as is generally found on sepulchral urns. No complete vessels of this type were found by me, only fragments at most of the archaeological sites. Thus, in the ground surrounding the funerary urn in grave 8 from Huanacocha some fragments of a vessel of the type in question were discovered (fig. 61), but the finds from the remainder of the sites mostly consisted only of the bulging portions that are typical of these vessels, especially those found on the neck. The abundance of this type of fragments proves how widely used these vessels were by the Indians of ancient La Candelaria. These vessels were probably employed in the fermentation of beer

v. Cuchiyaco, (G.M. 33.15.253), x. Unquillo, (G.M. 33.15.455),
 y. Cuchiyaco, (G.M. 33.15.260), z. Cuchiyaco, (G.M. 33.15.259).
 The height of the vessels a and b about 60 cm. The fragments
 e and o in scale 1/8 and the rest 1/4.

made from maize or chañar. Algarrobo beer may perhaps have been made in them, but the shape of the vessels would seem to argue against their having been used for that purpose. After the fermentation had been completed it must have been rather difficult to rinse out the used-up algarrobo fruits through the narrow neck. Or, these vessels would have been very suitable for keeping water in, the narrowness of the neck being apt to retard too rapid evaporation. The circumstance that vessels of this type are found practically intact in the ancient sites is interesting in so far as it indicates that the settlements may have been suddenly evacuated.

It is interesting to note how the bulges in the vessel type here dealt with vary as to shape. In fig. 81, *c—z*, are represented a series of bulges of this kind from the necks of vessels. The two fragments denoted by *e* and *o* each represents one of the main groups into which these fragments can be divided according to the shape of the bulges. The first of these groups, represented by fragments *c—n*, consists of fragments where it appears that a zoomorphic effect has been aimed at. In the following they will accordingly be referred to as zoomorphic. The second group, *o—v*, represents fragments with spherical bulges. As regards the zoomorphic fragments *x—z* it is uncertain — although it seems probable — whether they actually originate from vessels of the appearance here described. They differ from the rest in being massive. All the other fragments are hollow, and the method of producing them was by cutting out a hole in the neck of the ready-modelled vessel, and over this hole the bulge, more or less finally shaped, was fastened with clay. The same method was applied in the making of the larger bulges lower down on the vessel. Appended to fig. 82, *d*, is an illustration of how this fastening was done in detail. This method of affixing shows besides great resemblance to that employed in certain cases in attaching handles (cf. description of urn, fig. 67).

The fragments of the zoomorphic group generally have

the shape of the head of an ostrich (?). Besides the shape of the bulge itself, lines drawn on the beak so as to represent the mouth give further accentuation to its resemblance to a bird's head. Fragments *d* and *e* serve to illustrate this. In fragments *c* and *f* an additional detail is seen, namely a dot on the upper part of the beak, and a line parallel to its longitudinal axis, respectively. In the case of fragments *g*, *h* and *k* the line on the upper side of the beak has been replaced by a series of dots, which in *k* are placed so closely together as to form a line of impressed dots. Incised ornamentation consisting of lines of impressed dots are of especially frequent occurrence in fragments from the Parana delta (LOTHROP, 1, pl. XXIII: c, etc.; TORRES, 1, fig. 17: 4710, etc.). Through finds of the line of impressed dots is archaeological pottery, also known from the Province of Santa Fé (APARICIO, 4, figs. 8 and 16; SERRANO, 3, fig. 6: 1—2), the neighbourhood of the town of Parana (SERRANO, 1, fig. 15 and others), and the southern parts of the Province of Entre Rios (TORRES, 4, pl. I: 2 and others). These pottery finds SERRANO (2, p. 9) ascribes to the Chaná-Timbú Indians. In this connection it ought perhaps to be pointed out that certain earthenware bird's heads belonging to the culture ascribed to the Chaná-Timbú Indians present points of resemblance to finds made at Amazonas, in the Santarem district (Compare SERRANO, 1, fig. 38, and 2, fig. 5; APARICIO, 4, fig. 10, and 5, fig. 7, with NORDENSKIÖLD, 17, pl. XXXII. See also NORDENSKIÖLD, 17, fig. 3). In the Santarem pottery, however, the line of impressed dots is absent. As regards the above-mentioned finds from the Parana region it should however be noted that in certain cases the line of impressed dots perhaps consists of a line produced from the impression of a length of string. This method of producing ornamental lines has been dealt with by OURES (8), and it is frequently difficult to determine, solely by aid of illustrations, which of the methods it is that has been employed. The line of impressed dots is also found

in ceramics from the Comechingon region (GARDNER, fig. 25, b). GARDNER (pp. 328—329) points out in regard to this design that it is a form of ornamentation »which is also found on the pottery from the plains» (OUTES, 5, figs. 31—32, Provenance: Prov. Buenos Aires; OUTES, 6, fig. 177, Prov. Santa Cruz; OUTES, 7, figs. 6—8, Prov. Patagonien). A similar comparison has been made by FRENGUELLI and APARICIO (p. 134, pl. II, b) who, by means of the decorative detail here pointed out, have established a point of connection between the pottery from Laguna de Mar Chicita, in the province of Cordoba, and that of the Parana region. In fragments *l* and *m* on fig. 81 there is the further development of the bird's head having been provided with eyes, besides which on the latter fragment there is also a ridge in relief in the place of the incised line by which the mouth is usually indicated. This ridge extends up to the eyes and then continues down the neck, but it may nevertheless be supposed to represent the mouth. The fragment *n* I am inclined, although with some hesitation, to describe as representing the head of a bird, in spite of it having above the eyes yet another line in addition to that which represents the mouth at the termination of the beak. Whether this fragment be regarded from above or from below it therefore presents a zoomorphic, or possibly anthropomorphic, appearance. Fragments *i* and *j* provide further instances of how this ornamental detail has been given zoomorphic form. In these cases the bird's head has been replaced by the head of some other animal, but exactly which it has been intended to represent, is difficult to say. Like fragments *x—z* it is possible that they originate from vessels of a type differing from those which have here been discussed. In regard to all these zoomorphic fragments it ought to be mentioned that I do not know whether the beak on the intact vessel was turned downwards, like that seen in fig. 81, *e*, or upwards.

Fragments *o—v* show examples of variations within the second group of pottery bulges — those of more or less

spherical form. These terminate as a rule in a more or less accentuated point. Across this point one or two impressed lines are frequently found, e. g. fig. 81, *q*, *s*—*u*, a detail to some extent recalling the lines that in the zoomorphic group represent the mouth, as in fig. 81, *d*. Round the point of the bulge are frequently found a circle of dots or small rings, fig. 81, *u* and *v*. These designs have been impressed with an implement consisting of a severed, dry grass stem or a tubular piece of bone.

The larger bulges that are found lower down on these vessels do not present the same variety as to form as do

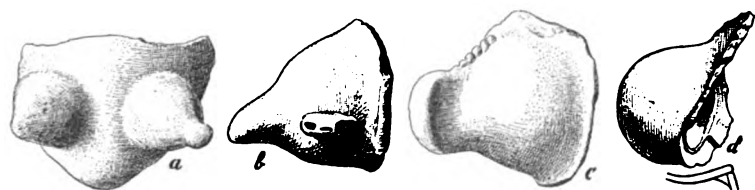


Fig. 82. Clay fragments. a. Unquillo, (G.M. 33.15.452), b. Unquillo, (G.M. 33.15.615), c. Cuchiyacu, (G.M. 33.15.258), d. Pantanillo, (G.M. 33.15.720). The detailed figure shows the method by which the large bulge was attached to the wall of the vessel. a and d $\frac{1}{9}$, b and c $\frac{1}{4}$.

those occurring on the upper part. These larger bulges are spherical or conical. Occasionally they terminate in a point which is more or less flattened from the sides. A purely spherical shape is seen in fig. 82, *d*. Adjacent to the sepulchral urn in grave 8 from Huanacocha (fig. 61) were discovered fragments of a vessel which had probably resembled that depicted in fig. 81, *b*. Only two bulges were however found, so it is possible that its shape may have been slightly different. In this case the spherical bulges terminate in a small and rather indistinct point, into which a short line had been impressed. On the large bottom fragment, fig. 82, *a*, the point is seen to be fully developed and somewhat flattened, and on the fragments depicted in fig. 82, *b* and *c*, a small ridge has been added on the upper side of the bulge. This

ridge is provided with a few impressed dots or transverse lines as seen from the figures. At Huanacocha were also found fragments of another vessel provided with bulges. (Huanacocha, grave 7). As already mentioned, it was not possible to ascertain the original shape of this vessel. Among

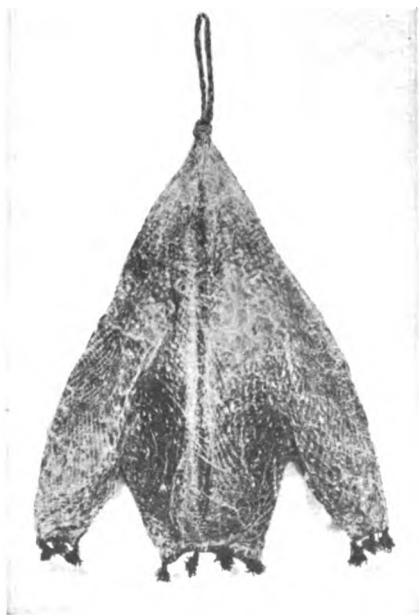


Fig. 83. Satchel made from the body skin of an ostrich. Toba Indians, province of Formosa, Argentina.

these fragments two are provided with two semi-globular bulges each. These measure, however, only 5 cm. in diameter. Below I shall mention a couple of vessels provided with bulges of the same size.

The shape of the vessels here dealt with is so unusual that it must raise the question as to how it came to be made. The Chaco Indians, as we know, frequently keep smaller articles in bags made from the skin flayed intact from the body of an ostrich. These bags are generally hung up inside the huts. A bag of this type, acquired

by the author among the Toba Indians, is depicted in fig. 83. When stuffed with their contents, the bags assume a shape similar to the clay vessel that is seen in fig. 81, *a*. It is not inconceivable that the vessel just referred to constitutes a copy in earthenware of an ostrich-skin bag of the above-mentioned kind. Certain details of its ornamentation seem to give colour to such a supposition. The bulges on the neck of the vessel represent the holes in the ostrich skin caused by

cutting away the wings, and these have subsequently been subjected to conventionalization in the form of birds' heads. The ridges that are found on the larger bulges on the fragments seen in fig. 82, *b* and *c*, no doubt represent the seams made in sewing up the apertures left by the legs. When vessels of this type have been provided with four large bulges in the lower part, this has been done for the sake of symmetry. The pottery of La Candelaria is especially characterized by an abundant variety of shapes, and thus the theory here advanced as to the origin of the vessel type in question is not altogether improbable, even if it cannot be advanced without a certain hesitation. Moreover, the ostrich, as already mentioned in the introductory chapter, occurs to this day in La Candelaria. In this connection it should also be mentioned that at the time of the Discovery the Indians of the Tucuman region possessed tame ostriches. NARVAEZ (p. 144) in regard to this states »criaban avertruces mansas en sus casas».

If one may judge from the finds that have been published, the type of vessel with bulges we are here dealing with also appears to be centred on the district adjoining Tucuman in the north. In Professor SCHREITER's collection in the Tucuman University Museum a fragment bearing a large bulge with a well-marked point is preserved, found at Siambón, on the eastern slope of Aconquija in the province of Tucuman. The same collection also possesses another large, spherical pottery bulge from Tucuman itself (No. 209 of the collection), and a clay vessel, about 30 cm. high, from the region between Vipos and Tapia (fig. 84). Apart from its size, this vessel presents a great deal of correspondence with those here dealt with. It has four bulges symmetrically disposed round its body at a height seen in the illustration, and on the side which is turned away from view, there is yet another which is smaller than the rest. It is placed between, and somewhat higher than, the other bulges. A small bulge, on the whole very similar to fragment *m* in fig.

81, also forms part of SCHREITER's collection. This fragment was found at Katigal, 20 km., north of Tucuman. Another bird-shaped fragment was found by AMBROSETTI (fig. 144: 6) at Pampa Grande, and a fragment of this type seems to be one that LAFONE QUEVEDO (I, pl. II: 6) depicts from the neighbourhood of Andalgalá. As to the latter



Fig. 84. Clay vessel from the region between Vipos and Tapia, province of Tucuman. (U. M. o. T. Col. SCHREITER 207) 1/4.

statement, it can only be accepted with a certain degree of reservation seeing that the appearance of the fragment is not made thoroughly clear by the illustration and the description. Its provenance falls besides outside of the distribution area proper of the vessel type in question. A vessel almost identically similar to that illustrated in fig. 84 has been published by AMBROSETTI (I, p. 73, pl. IV). Its provenance is stated as Tucuman, and Ambrosetti holds it to be a product of Calchaqui Indian ceramic art. Yet another

vessel closely resembling those just referred to has been depicted in another work by AMBROSETTI (2, vol. XVII, pp. 530—531). As appears from the illustration it has at least five bulges in its widest part, and on the neck a human face has been rather roughly fashioned. The provenance of this vessel is unknown, but it belongs, however, to the well-known Zavaleta collection from the Calchaqui district. SCHREITER (I, fig. 16: 2; here reproduced in fig. 85) illustrates another vessel type with bulges

and anthropomorphous ornamentation. As will be apparent from fig. 85, in this case the face has been more carefully modelled, and on the side of the neck opposite to the face has been placed a handle with one end attaching to the edge of the rim, and the other to the lower, spherical body of the vessel, while at the points where the arms should have been, two very pronounced spherical bulges are found. By reason of the vessel being



Fig. 85. Clay vessel from La Candelaria. Scale about $\frac{1}{3}$.
(After SCHREITER).

provided with a handle it should perhaps more properly have been classed with the group that is dealt with below. In the matter of its classification, however, its strongly marked bulges have been given decisive importance. A vessel which partly resembles the one just referred to is seen in fig. 87, *c*, where, however, the »bulges» are replaced by a pair of wart-like projections. On the sepulchral urn, fig. 46, a pair of bulges are also observable with a placing similar to that in the vessel just mentioned, although not so strongly marked.

In this connection it may also be pointed out that certain sepulchral urns from the Calchaqui valley are provided

with bulges to which a zoomorphic form has been given. An example of this can be seen in the Gothenburg Museum, a 105 cm. high sepulchral urn which is provided with two bulges of this description (G. M. 30.39.1). In this respect this vessel entirely corresponds with one published by AMBROSETTI (2, vol. XX, fig. 163). AMBROSETTI's catalogue of the archaeological Diaguita collections in the Museum für Völkerkunde, Berlin (in manuscript preserved in Buenos Aires), includes a clay vessel with bulges from Paso, Fuerte Quemado (BREGANTE, fig. 134). On this vessel the bulges are shaped so as to represent armadillo heads.

As will be seen from what has been said above, «bulges» on clay vessels constitute an element which is common both to Diaguita vessels and vessels from La Candelaria and adjoining regions. Vessels of the appearance seen in fig. 81, *a—b*, are, however, so far as I am aware, absent in the Diaguita district. In the foregoing I have shown that this vessel type occurs in the province of Tucuman and the southernmost part of the province of Salta (La Candelaria). Therefore it appears to be typical of the La Candelaria culture. This is a point to which I shall recur later. I am also of opinion that the two small clay vessels published by Ambrosetti that so far have been considered as being of Calchaqui origin, are more properly ascribable to that same culture.


In regard to the La Candelaria finds, thanks to such clay vessels as have been preserved intact it is not difficult to determine the character of the pottery bulges of bird's-head shape with which we are here concerned. In the archaeological collections acquired by Professor ERLAND NORDENSKIÖLD from the Mizque valley in Bolivia — which collection constitutes the farthest easterly evidence of the distribution of the Tiahuanaco culture so far known — are preserved two fragments which at a cursory glance appear to correspond to those which I have here referred to as resembling birds' heads. One of these fragments (G. M. 15.2.23, depicted by NORDENSKIÖLD, 4, fig. 3: b), collected at the ar-

archaeological site of Quinales, resembles the fragment seen in fig. 81, *d*, but lacks the line representing the mouth. The fragment from the Mizque valley is hollow, it is true, but the hollow forms a closed space, into which have been placed a number of hard particles which produce a rattling sound when the object is shaken. If the fragment be carefully examined, traces of a rim can be seen, and it is therefore evident that the fragment is nothing but the rattling foot of a clay vessel, just as is the case with another fragment from Perereta in the Mizque valley, also illustrated by NORDENSKIÖLD (2, fig. 54, or 3, pl. 15: d) in an account of his expedition to that locality, and as such they have both been described by him. Another fragment in Nordenskiöld's collection from Pulquina, La Franca, in the Mizque valley (G. M. 15.2.21) shows still greater resemblance to the La Candelaria fragment in question inasmuch as it is hollow in the same way as the La Candelarian birds' heads. It, too, is however a foot of a vessel. I mention this seeming resemblance between the finds from the Mizque valley and those from Candelaria because of the actual correspondences that in other respects exist between the two groups in question. Crescent-shaped ridge handles, for example, occur among the Mizque valley finds (cf. p. 200). Whether this handle type belongs to the Tiahuanaco-influenced ceramics, or to the more primitive pottery of the same district that is known from the archaeological site of Holquin (NORDENSKIÖLD, 2, fig. 39), I must leave an open question by reason of the Mizque valley finds never having been conclusively published by Erland Nordenskiöld. The incised ornamentation found on the primitive pottery of the Mizque valley moreover presents certain points of resemblance, though very slight, to the ornamentation on the Candelarian finds. Certain anthropomorphous pottery fragments from the Mizque Valley also possess parallels among the finds from Pampa Grande and La Candelaria (fig. 113).

One-handled symmetrical clay vessel.

In figs. 86 and 87 are grouped together a series of clay vessels from La Candelaria whose common feature is the single handle. The vessels on fig. 87 all belong the Tucuman University Museum collections.¹⁾ In regard to their provenance nothing is known beyond their having been found in La Candelaria.

Fig. 86, *a*. This clay vessel is of greyish black ware, with the outer side slip-finished. A band of ornamentation level with the handle. Present height of vessel 17.5 cm.

— *b*. Of greyish brown ware, and outer side slip-finished. As is apparent from the figure, the neck is ornamented with vertical, shallow grooves, and on either side of the belly of the urn is an ornament consisting of a relieved, narrow ridge. This begins down at the foot below the handle, runs straight up to the neck from where it continues horizontally to a point opposite the handle, where again it turns and runs perpendicularly down to the foot. Hence its course forms a figure like this: , as is partly visible in the figure. The side of the vessel turned away from the spectator is similarly ornamented. Short lines are impressed across the ridge. On the edge of the rim, at the point where the handle joins it, are two small rim-bosses. The height of the vessel is 30 cm.

— *c*. Of dark-coloured, almost black, ware. The outer side of inferior polish. On the lower portion of the neck two small bosses with impressed lines are oppositely placed, one of them being visible in the figure. They are possibly meant to represent human faces. Height of vessel 23 cm.

— *d*. Of greyish black ware, the outer side rudely polished. Neck ornamented with a double zigzag line. Height of vessel 13 cm.

— *e*. Of dark-coloured ware, almost black, and poorly polished wall surface. Upper portion of vessel missing, present height 9.5 cm. A horizontal groove in the wall of the

¹⁾ In the following U. M. o. T. denotes that the object belongs to the University Museum of Tucuman.

vessel marks the line where the neck and the belly portion meet. On the lower part of the neck are found traces of an incised ornament.

— *f*. Of grey-coloured ware, and with outer sides inferiorly polished. The edge of the rim is provided with a

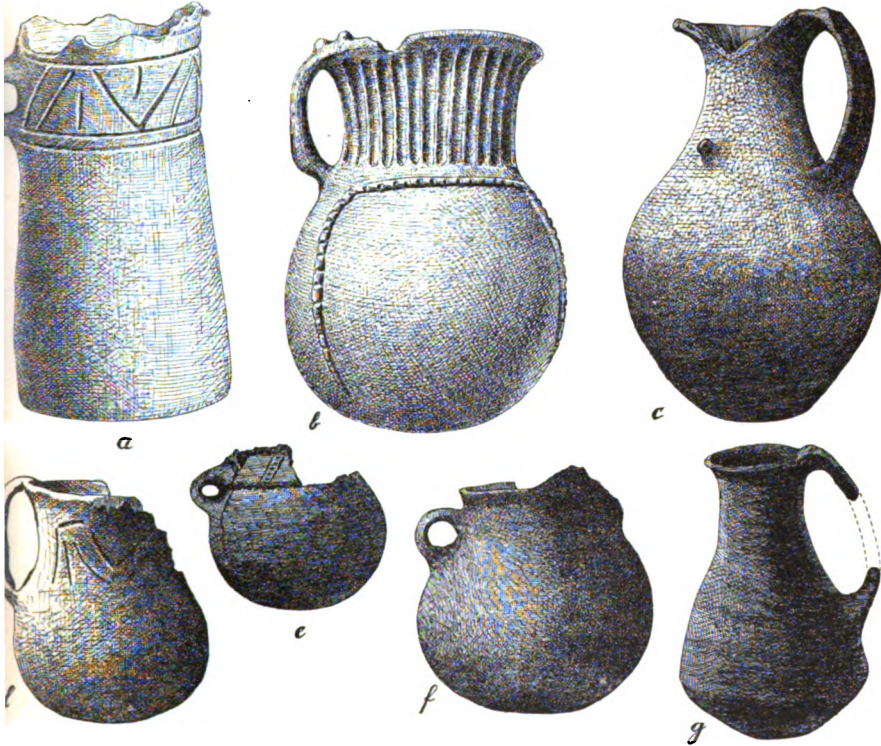


Fig. 86. One-handed clay vessels. From various unspecified localities in La Candelaria. (U. M. o. T.)

lip, which however is partly broken off. Height of vessel 15 cm. As regards this vessel it is known to have been found inside a sepulchral urn.

— *g*. Of dark-coloured, almost black, ware, and with polished walls. Height 15.5 cm.

On vessels *b*, *c*, *d* and *g*, where the handle is fully developed,

its upper end appears to have been attached to the rim itself, or to the inner wall of the vessel (cf. LINNÉ, 2, fig. 32, b). One of the vessels, fig. 85, *f*, is provided with a lip. From Argentina, vessels with lips are known from Viluco, in Mendoza (BOMAN, 8, fig. 6); from Pampa Grande (AMBROSETTI, 4, fig. 14); from Aimagasta, in La Rioja (BOMAN, 2, fig. 26) and from Quilmes (BRUCH, 1, fig. 29). A lipped vessel is known from Chile, from a kitchen-midden at Milpille, Casablanca (OYARZUN, 1, fig. 12). Lipped vessels have hitherto been set down as post-Columbian (NORDENSKIÖLD, 10, p. 154; NORDENSKIÖLD, 11, p. 21; BOMAN, 8, p. 508). None the less it would however appear as if the »lip» were a pre-Columbian element. It often occurs on vessels of a type resembling the shoe-shaped vessels (BRUCH, 1, fig. 29, and OYARZUN, fig. 12); and here in La Candelaria also on symmetrical vessels. On the vessels just referred to the lip is placed opposite the handle. Whether, on the other hand, vessels on which the lip is set at an angle of 90° to the handle are to be considered pre-Columbian is a question on which I am not prepared to pronounce an opinion. A vessel of the latter type is published by BOMAN (8, fig. 6). This originates from Viluco, in Mendoza and from a post-Columbian dwelling site. In this connection may also be mentioned the bailer-shaped clay vessels from La Candelaria (fig. 95, and SCHREITER, 1, fig. 15: 2) which, of course, to a certain degree are provided with lips.

In fig. 87 are depicted four more one-handled clay vessels. All of them form part of the collection brought together by SCHREITER (1, figs. 15: 5 and 9 and fig. 16: 6—7) from La Candelaria and published by him. They are here reproduced so as to complete the collection of types. No detailed description of them is given by Schreiter. They are, however, made of the same kind of ware as the rest of the one-handled vessels. As regards the vessel in fig. 87, *a*, it is possible that it originally had two handles. A small lump projecting from the right-hand side of the vessel seems

to indicate this, but the detail in question is not sufficiently distinct in the illustration. The vessel denoted as *d* in the same figure appears, so far as can be judged, to carry an anthropomorphous ornament on the side opposite the handle.

In fig. 87, *b*, is seen a small, bowl-shaped vessel with incised ornamentation, provided with one handle and having a rim-boss in the form of a bird's head immediately above



Fig. 87. One-handed clay vessels from La Candelaria. Scale about $\frac{1}{3}$.
(After SCHREITER).

the handle. The bird's head is turned outward, thus in this respect corresponding with the fragmentary anthropomorphous rim-boss seen in fig. 115, *d*. Also in this case the handle was placed immediately below the rim-boss.

Hanging vessels.

The clay vessels illustrated in fig. 88 are all provided with vertically set handles. Vessels *a* and *b* are hanging vessels, and as such — although with some hesitation — I also inclined to describe *c* and *d*. The two first-mentioned vessels are provided with the long and cylindrical handles that are especially typical of hanging vessels. The custom-

ary ornamental design, the zigzag line, occurs on vessel *a*, and on the belly portion of *b*.

Fig. 88, *a*. Of greyish black ware, and with concave bottom. Height 13 cm.

— *b*. Like the foregoing. Height 14.5 cm.

— *c*. Grey-coloured ware, crude outer finish. Height 17 cm.

— *d*. Of dark, almost black, ware with slip-finished walls. The upper portion of the vessel is missing, the height of the remainder being 20 cm. Above the handles can be discerned traces of incised ornamentation horizontally extended. On the side turned away from the spectator there are three double zigzag lines resembling the two that are seen in the figure. The bottom is concave.

The first of the vessels here depicted originates from some unspecified locality in La Candelaria, and was acquired through purchase by the author during a visit to this department. It is partly restored. The other three vessels belong to the University Museum at Tucuman, and their provenance is merely stated to be La Candelaria.

If we study the clay vessels of any of the Chaco tribes proper, e. g. the Ashluslay, Choroti, or Toba Indians of our days, and in doing so leave the cooking vessels out of account, what immediately strikes us is that nearly all of the vessels have been given a shape that facilitates their being taken along on journeys. The majority consists of water receptacles of the spherical, or slightly flattened, shape that is typical of the Chaco tribes. They are provided with a short and narrow neck, and small handles to which is attached a strap so as to allow of convenient carrying. Domestic economy among the Chaco tribes in a high degree depends, as we know, on hunting and fruit-gathering, whereby are involved extensive wanderings through dense forest regions that especially in the dry season are waterless. From these conditions the vessel types have been evolved. The absence of similarly typed vessels among the finds from

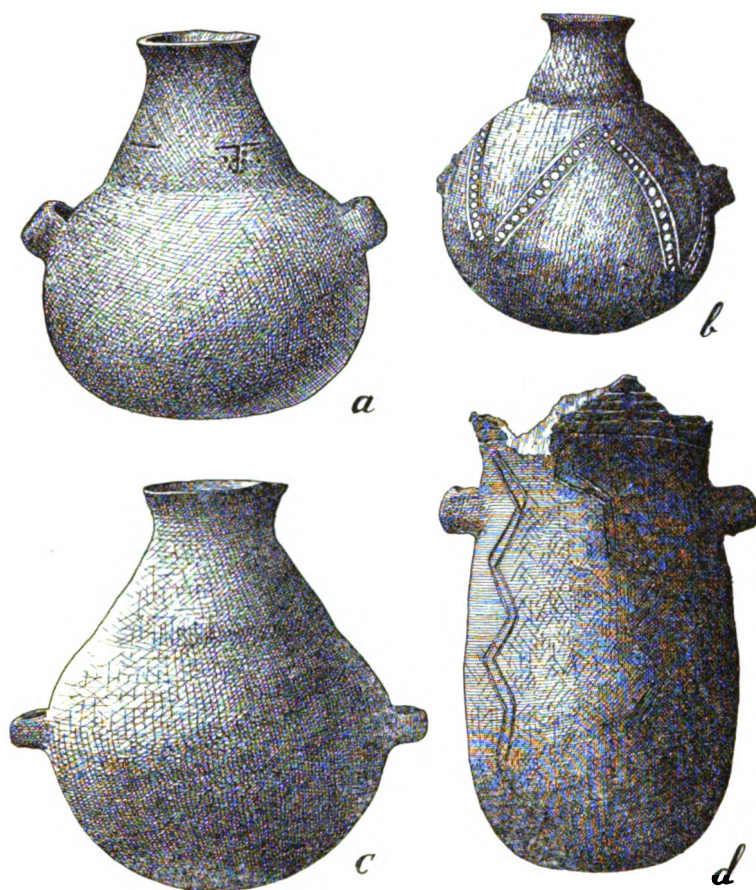


Fig. 88. Hanging vessel from various unspecified localities in La Candelaria. (a, G.M. 33.15.655, b—d. U. M. o. T.)

La Candelaria proves that the Indians in question had settled abodes. Their domestic economy was based on agriculture, i. e. the cultivation of maize. La Candelaria may quite possibly be better supplied with water in the dry season than the Chaco proper, but the difference in this respect is however not so great as to serve by itself to explain this absence of vessels that are suitable for use as a sort of

water-bottles on long distance travelling. Another type of hanging vessel, which will be discussed in another connection, is that represented by the vessel depicted in fig. 93, *b*.

Cylindrical or bottle-shaped clay vessels.

A group of vessels that appear to be typical of the ancient culture of La Candelaria are those of bottle, or cylindrical,

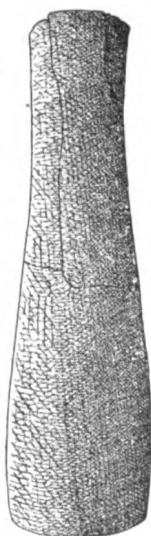


Fig. 89.

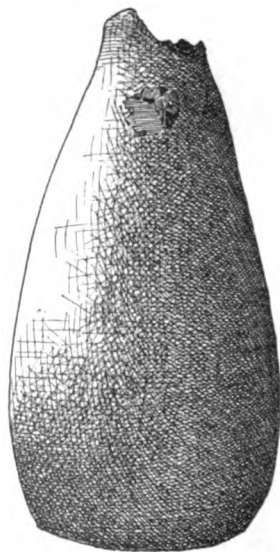


Fig. 90.

Fig. 89. Cylindrical clay vessel from La Candelaria. Scale $\frac{1}{4}$.
(After SCHREITER).

Fig. 90. Bottle-shaped clay vessel. La Candelaria. (U. M. o. T.)

shape. I know of no other similar finds from elsewhere in Argentina. What distinguishes cylindrical or bottle-shaped clay vessels from cup-shaped ones is that in the latter the wall of the vessel is concave while in the former it is more or less convex. The vessels, fig. 86, *a*, and 87, *a* and *d*, would prima facie seem to be cylindrical or bottle-shaped, but as in addition they are provided with a small handle they cannot

be classed with this group of clay vessels. The same applies to twohandled cylindrical vessels, fig. 88, *d*. A typical cylindrical vessel is seen in fig. 89, and has already been published by SCHREITER (I, fig. 15: 7). In the present paper another kind of vessel more bottle-like in shape (fig. 90) is illustrated. It is of greyish ware, with wall surfaces of inferior polish. The upper portion of the vessel has been broken off, the remaining part having a height of 18 cm. On one side of the vessel are some remains of an ornament in relief, probably meant to represent a human or animal head. The vessel belongs to the University collections at Tucuman.



Fig. 91. Cup-shaped clay vessel. La Candelaria. (U. M. o. T.)

Cup-shaped earthenware vessels.

(Rim-bosses).

In the Tucuman University Museum collections is preserved a cup-shaped clay vessel from the department of La Candelaria (fig. 91). It measures 16 cm. in height and is made of greyish black ware, with slip-finished surface. The edge of the rim is adorned with a small rim-boss in the form of an animal head. The face is turned outwards, and the mouth indicated by an impressed line of dots whereby a strong illusion of teeth has been effected.

BREGANTE (I, p. 251 and foll.), in her studies of ancient ceramics in northwestern Argentina has also given attention to the cup-shaped clay vessels that are found in that district. Cup-shaped vessels of wood or earthenware are common on the plateau, and especially abundant in Tiahuanacan culture. Bregante rightly maintains that the occurrence of

cupshaped clay vessels in northwestern Argentine must be ascribed to contact with peoples of the highland plains. Whether — as is done by Bregante — vessels of similar shape but provided with a handle should properly be classed among cup-shaped vessels is however a matter admitting of some doubt.

From the province of *Jujuy* Bregante mentions the following localities as provenances of cup-shaped clay vessels: La Isla, Humahuaca, Pucará de Rinconada, Sayete, Sansana.

From the province of *Catamarca*: San José.

From the province of *San Juan*: Barrealito.

Cup-shaped vessels also occur in the province of Santiago del Estero (EMILE and DUNCAN WAGNER, pl. X).

Cup-shaped vessels were probably also made from the brown ware that is so sparingly found among La Candelarian pottery, and which I shall deal with below in a separate section of this paper (p. 206 and foll.). This because a small fragment of this class of material (fig. 115, *i*) seems to have formed part of a cup-shaped clay vessel.

In the present connection a few words properly be said in regard to rim-bosses.

On clay vessels from La Candelaria, the rim-boss has been given a great variety of shapes. Rim-bosses are most frequently found on small bowl-shaped vessels. Large bowls used as lids on sepulchral urns are usually provided with large rim-bosses. The largest ones I know of occurred on the lid of a funerary urn from Santa Barbara (fig. 23, *b*). Rim-bosses on bowls used as urn lids are generally semicircular (cf., e. g., fig. 43) and then, as is often the case with rim-bosses on the smaller, incised-ornamented, bowls, decorated with a series of impressed lines running across the edge of the rim. In cases where rim-bosses are absent on the larger lids, these are instead provided with crescent-shaped ridge handles, or handles in the shape of cylindrical solid projections (figs. 45 and 63). In fig. 111, *a—c*, *e* and *n*, other kinds of fragments provided with rim-bosses

are seen. The form of rim-bosses found on the smaller-sized earthenware bowls most frequently occurring is very small and generally ornamented with a few incised lines running across the edge of the rim (cf., e. g., fig. 106, *r*). Rim-bosses generally occur in pairs, either placed opposite each other (fig. 105, *d*), or side by side as is seen in fig. 105, *b* and *f*, and fig. III, *a*. In the latter case the rim-bosses are curved slightly inwards, and at the point provided with an impressed line which may possibly constitute a relic of some anthropomorphic or zoomorphic shape, the mouth of which was represented by the line just referred to. SCHREITER (I, fig. 15: 3) illustrates a bowl from La Candelaria with three rim-bosses placed at equal intervals round the edge of the bowl. On fragment *b* in fig. III the rim-boss is cylindrical and hollow, with impressed lines across its edge. The rim-boss, fig. III, *c*, is of a peculiar and undefinable shape. Here it is not possible to determine whether it is meant to represent the head of an animal or a human being. The greater probability lies, however, with the latter. In anthropomorphic vessels and figures from the Diaguaita district a number of lines, or rows of dots, are often seen below the eyes, and these lines would appear to represent tears running down the cheeks (BREGANTE, figs. 30, 43—44, 307—310). In the fragment just referred to are seen a series of vertical, parallel lines, at their terminations connected by four horizontal lines, thus dividing this incised ornament into two groups. Probably these lines are meant to indicate the tear-resembling decoration of the Diaguaita vessels. A sepulchral vessel from Brazilian Guiana, which has been published by GOELDI (pl. II: 17), also carries this tear-resembling decoration, and it is also found on a vessel discovered in a grave at El Dorado in Valle del Cauca, Colombia (WASSÉN, fig. 7). It is further found on the vessels in figs. 93, *c*, 103 and 117, *b*, and on the fragments, fig. III, *d* and *g*, from La Candelaria. One may reasonably wonder whether it really is tears that are meant to be repre-

sented. There is no absolute certainty on this point. GRUBB (p. 164) relates however that at a death the Lengua Indians blacken their faces with charcoal, and that thereby special streaks are painted that are designed to indicate tear-flow. It would be interesting to know whether all such anthropomorphous clay objects as are provided with rows of dots, or streaks, on the cheeks below the eyes constitute grave-equipment. If they do, this detail of decoration must in some way be representative of mourning or protection against demons (KARSTEN, I, p. 36). As regards the similarly decorated clay figures from southern Argentina, the only thing to be learnt of them is the locality where they were discovered, but not under what circumstances. It is worth noting, however, that this decorative detail so frequently occurs on sepulchral urns in particular. As regards the fragment, fig. III, *e*, this may also be supposed to be a rim-boss, and, denoted by *n* in the same figure, is another rim-boss from a bowl-shaped clay vessel in which besides on the inner wall of the vessel a dotted line has been placed below the boss.

Asymmetrical vessels.

Even so-called asymmetrical, or shoe-shaped, vessels are represented among the finds from La Candelaria. SCHREITER (I, fig. 15: 7 and 6) has in his paper on the archaeology of La Candelaria illustrated two vessels of this type. One of them (SCHREITER, I, fig. 15: 6) is here reproduced in fig. 92, — the other vessel depicted by him is much of the same shape. In fig. 93 are further reproduced three asymmetrical clay vessels from La Candelaria. All of them belong to the Tucuman University Museum's collection, and are, as will be noticed, more gracefully shaped than the vessels of the same type that have been published by Schreiter. A noteworthy point of difference consists in the placing of the handle. On the vessel seen in fig. 92 and fig. 93, *a*, this is placed on the side of the vessel that is least bulging, while on vessels *b* and *c* in fig. 93 the handle is placed on the same side

as the most convex part. What purpose these asymmetrical vessel served is uncertain. AMBROSETTI (4, p. 58) and BREGANTE (pp. 239—240) have expressed the opinion that these asymmetrical vessels were cooking pots designed for placing close to the fire, with the bellying side turned towards it. Thanks to the handle being placed on the less bulgy portion of the vessel, it is easy to remove the vessel from the fire without burning oneself when its contents are boiling hot.



Fig. 92. Asymmetrical clay vessel from La Candelaria. Scale about $\frac{2}{3}$.
(After SCHREITER).

As a rule these asymmetrical clay vessels are fairly small, and of inconsiderable capacity. In view of this they may be supposed to have been designed for preparing medicines, or the like. The explanation advanced by Ambrosetti and Bregante as regards the origin of the asymmetrical vessel type applies well to the vessels seen in fig. 92 and fig. 93, *a*. On the two vessels, fig. 93, *b* and *c*, on the other hand, the handle is placed on the side of the vessel where the wall is most convex, so that here Bregante's explanation of the shape of the vessel does not apply. As regards the vessel seen in *b* it is most probable that it was designed to be used as a hanging vessel, seeing that, in addition to the handle it is also provided with a perforation farthest away

on its outbulging side. The vessel has also been given two feet — one of which is broken off — while its bottom has served as the third »foot». The vessel, fig. 93, *a*, is made of greyish coloured ware, and its outer side slightly glossed by a coating of slip. Here, for the first time, we come across the spiral-twisted handle, made by twining two rolls of clay together, a type of handle to which I shall recur later. The gibbous side of the vessel is provided with a slab-shaped projection with two lines impressed across the ridge. Its height is about 8 cm. The vessel *b* in the same figure is of more reddish ware, and has the outer side slip-finished. On the side opposite the handle there is a relieved ornament of anthropomorphous design. Especially noticeable is the strongly projecting jaw region. In this respect the vessel resembles two finds made by Schreiter in La Candelaria (figs. 94 and 96). Of a similar shape is the jaw region in an anthropomorphous fragment from Tafi (QUIROGA, 3, fig. 49). Below the edge of the rim the vessel is ornamented with a series of circular impressions made by means of a dry grass stalk fig. 93, *b*. Of the vessel fig. 93, *c*, is known that it was found inside a sepulchral urn, which was in a very bad state of preservation, but the exact locality in La Candelaria where this vessel, as well as the foregoing two, was found is uncertain. It is of a greyish colour, and its outer side appears to have been treated with slip. Besides the incised decoration that can be seen in the figure, there is, it may be added, a vertical dotted line below each of the eyes. The dots are so disposed as to give an impression of representing tears running down the cheeks. In addition, a dotted zigzag-line runs down the handle. The dots are triangular, and placed so closely together as almost to form a connected line. Another noteworthy feature of this vessel consists of the two projections on its sides, and a third one placed on the most bulging portion. This formation undoubtedly connects it with the bird-shaped vessels that are found in the Diaguita district. Two vessels of this type, from Distrito de Seclantás,

Dept. Molinos in the Calchaqui valley, are depicted by AMBROSETTI (2, vol. XVII, figs. 39 and 40). Both of these vessels are globular. They are provided with a bird's head on a slender neck, which, in conjunction with the three projections — two of which indicate the wings and the third the tail — goes to show that the representation of a bird is in-



Fig. 93. Clay vessels from unspecified localities in La Candelaria.
(U. M. o. T.)

tended. Another typical ornithomorphic vessel from Quebrada de Humahuaca is depicted by v. ROSEN (fig. 233). A vessel on which this combination of ornithomorphic and anthropomorphous ornamentation occurs originates from Quilmes, and is illustrated by BRUCH (I, fig. 30). This vessel much resembles the one from La Candelaria shown in fig. 93, c, in having the bellying portion ornamented in the same way, i. e. with a zigzag line. Below the eye are besides found three lines, possibly meant to represent tears, and, lastly, also on this vessel three projections inherited from the ornithomorphic clay vessels are found. These are decorated with

a number of incised lines, similarly to the La Candelaria vessel. Another vessel from the Calchaqui district, of much the same appearance, is depicted by AMBROSETTI (1, pl. I). On this, however, the zigzag line in the bellying portion is replaced by painted decoration of a different kind. Finally, there is yet another asymmetrical vessel type on which this combination, above referred to, of ornithomorphic and anthropomorphous ornamentation can be observed. This type is represented by two clay vessels from La Rioja, published in a posthumous work by BOMAN (2, figs. 18 and 51). Boman calls this type »calceiformes». On the vessels in question the handle is placed on the same side of the neck as the anthropomorphous decoration, of which it forms part as the nose. In this connection may also be mentioned a vessel published by DEBENEDETTI (3, fig. 98), which is similarly provided with the three projections in question. It was found at Angualasto, in the province of San Juan. MEDINA (p. 422, fig. 178) depicts a vessel from Principal Santiago, in Chile, on which the three projections occur but the anthropomorphous decoration is absent. On this vessel the handle is similarly placed as on the La Candelaria vessels, and it is besides provided with a painted ornament in the same place as the incised one on the La Candelaria vessels, a similarity still more striking as the zigzag line is an element of the painted design. Medina is able to class this vessel as bird-shaped on account of the three projections. Asymmetrical vessels on which the handle is placed on the bellying, or the opposite side, and which lack anthropomorphous or ornithomorphic decoration, have also been found in the neighbourhood of Santiago (MEDINA, figs. 212 and 213). An asymmetrical vessel resembling fig. 93, c but without the three projections is found in the Ica valley in a burial place with ceramic showing Tiahuanaco influence (UHLE, 3, pl. XI: 4). Judging from everything, it thus seems as if the entire material of asymmetrical vessels should be dealt with as a whole, and that no

doubt their occurrence in La Candelaria may be ascribed to influence from the adjoining western highlands. BREGANTE (pl. XV) has studied the archaeological distribution of this type of vessels in northwestern Argentine, and from the map of distribution she has published it appears that the majority of authenticated finds of vessels of this type originate from the provinces of Jujuy, Salta, and the northeastern portion of Catamarca. Three archaeological sites are established from the province of San Juan, and, thanks to the recently published work by BOMAN (2, [vide supra]) we now

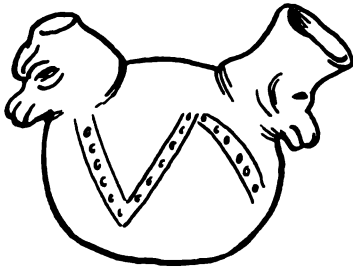


Fig. 94. Clay vessel. Scale about 1/3. La Candelaria. (After SCHREITER,

also know that the type is represented in the province of La Rioja. Two finds are known from localities not far from La Candelaria, viz. Pampa Grande (AMBROSETTI, 4, fig. 53) and Guachipas. On the Pampa Grande vessel we again meet with the spiral-twisted handle. It may also be stated that asymmetrical hanging vessels are found to-day among the Chaco Indians at Pilcomayo (NORDENSKIÖLD, 18, fig. 59, a—b).

A vessel which hitherto remains unique among archaeological finds from La Candelaria, but nevertheless may somehow be classed with the asymmetrical vessels here dealt with, is that illustrated in fig. 94. This vessel has been published by SCHREITER (1, fig. 16: 8). No provenance is given, nor any information as to the character of the clay material. This would however appear to be more or less grey-

coloured, like the ware in the remainder of the vessels here dealt with. As will be seen from the illustration, its bulging portion is provided with incised ornamentation consisting of parallel zigzag lines, and between these lines there is a row of annular dots. The neck-shaped spout which is provided with anthropomorphous ornamentation, is placed near the extreme edge of the vessel. By way of a pendant to the spout, on the opposite side of the vessel is placed a protuberance which has been given anthropomorphous ornamentation matching that seen on the spout. It is worth noting that in both these faces the mouth region is strongly projecting. A vessel of a certain resemblance to the one just mentioned from Humahuaca is depicted by BOMAN (I, vol. II, fig. 193) and another is published by OYARZUN (I, fig. 7). This vessel was found at Casablanca, in central Chile. In this case the neck lacks anthropomorphous ornamentation, and on the protuberance the anthropomorphous ornamentation is turned inwards.

"Bailer"-shaped vessels.

Another type of asymmetrical vessel is that seen in fig. 95. I have called this type »bailer»-shaped. The distinguishing feature of this type, when compared with other asymmetrical vessels, is the position of the handle which in this type is placed at right angles to the longitudinal axis of the vessel. The vessel in question was found at Caspinchango. This I bought from its finder who had come upon it smashed into a number of fragments. It is only after its preservation, and after SCHREITER had published his paper on the archaeological finds made by him in La Candelaria, that I was able to determine its original appearance. On one of its sides there is the vestige of a handle, and, judging by everything, the vessel must have been of the same shape as that depicted by SCHREITER (I) as No. 2 in fig. 15. A conceivable use of these vessels I have already suggested above (p. 63). The material of this fragmentary "bailer"

we are here concerned with is of grey colour and 8 mm. thick. The preserved portion of the vessel measures 40 cm. in length, and its outer side is slip-finished. Vessels of this type are unknown to me from other parts of the Argentine. Possibly it has been developed from the "shoe-shaped" or asymmetrical type of vessel. Thus from Peru (Anta) I know of a vessel that in shape much resembles the one here dealt with (WIENER, p. 595). The placing of the handle is the same as on the vessel we are here concerned with, but the mouth is of a different shape in that it is elongated so as to form a neck.

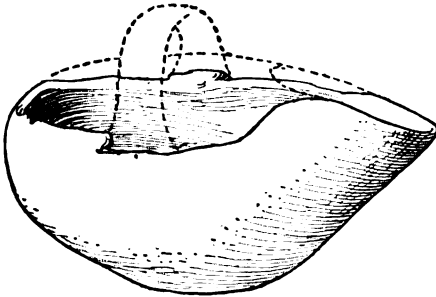


Fig. 95. Bailer-shaped clay vessel from Caspinchango, La Candelaria. (G.M. 33.15.746).

Intercommunicating vessels.

Of especial interest among the different clay vessels published by SCHREITER (1, fig. 15: 16) in his paper on La Candelaria is that here reproduced in fig. 96. This is a so-called "intercommunicating" vessel, i. e. a vessel consisting of two globes connected by a tube. The mouth of the vessel is found on one of the globes. The neck of the mouth portion is provided with an anthropomorphous ornament, and the rim of the mouth is connected with the other globe by means of a twisted handle. Intercommunicating vessels are in South America found in a variety of shapes, and thus may consist of two or more globes placed together in the same plane, or one above the other, hour-glass fashion.

Intercommunicating vessels with the globes in the same horizontal plane have a preponderantly westerly distribution in South America. Modern vessels of this type are known to me from the Chocó Indians of northern Colombia (NORDENSKIÖLD, 9, fig. 66, a: 26), from the Chebero Indians of western Brazil (TESSMANN, fig. 80: 11) from the Chiriguano Indians of Bolivia (NORDENSKIÖLD, 8, fig. 41: 8 and 9) and outside the above mentioned region, from the Palikur Indians of Brazilian Guiana (NIMUENDAJÚ, fig. 14). In the Rautenstrauch-Joest Museum, Cologne, are further preserved two intercommunicating clay vessels, one consisting of three, the other of four, globes. These vessels — like another one consisting of two intercommunicating globes found in the Dresden Museum — are stated to originate from Guianan Caribs. Archaeological vessels of this type are exceedingly common in Peru. In the black ware pottery of the Lambayeque district they are especially abundantly represented, and there usually consist of two globes, one of which is provided with an ornithomorphic ornament containing a whistle, probably intended for use in imitating a bird-call. In the Gothenburg Museum collections intercommunicating vessels are found from other Peruvian sites viz. Terrenafe (G. M. 20. 9. 70), Valle Viru (G. M. 22. 1. 22), Chimbote (G. M. 22. 1. 15), Chicama (G. M. 22. 1. 56) and Trujillo (G. M. 23. 5. 6). The same collections also possess a vessel from Nasca (G. M. 35. 32. 27), consisting of two globes, one of which is of human form and fitted with a whistle-producing arrangement. It has been depicted by IZIKOWITZ (fig. 238). Izikowitz has studied these vessels in their capacity of sound-producing objects, and mention several other finds of this description from the Peruvian coastland. Many more instances of this vessel type might be adduced from Peru, but the cases here cited are sufficient to show the widespread occurrence of the type in this part of the Andine highland. Intercommunicating vessels of archaeological origin from Ecuador are published by RIVET and VERNEAU (pls. XXXVIII:

14 and 16, and XI: 2 and 16); JOYCE (pl. 3: 13) publishes one from Antioquia, Cauca valley, Colombia, while from Chile we know them from the works of OYARZUN (2, p. 385, fig. 18), and MEDINA (fig. 68). NORDENSKIÖLD (7, pp. 12—13) found a fragmentary vessel of this type in a so-called »sepulchral hut» in the Pelechuco Valley, in Bolivia, close to the border of Peru. From Argentina I know archaeological finds of intercommunicating vessels from the province of La Rioja (BOMAN, 2, fig. 55, b), from Tilcara (DEBENEDETTI, 4, figs.

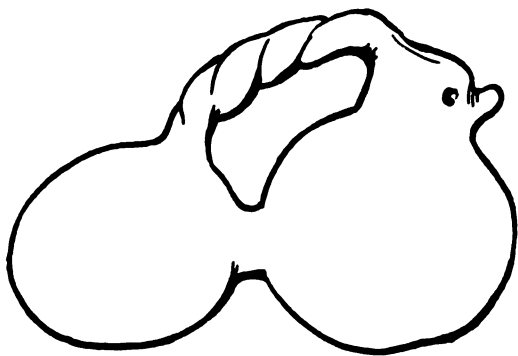


Fig. 96. Intercommunicating vessel from La Candelaria. Scale 1/3.
(After SCHREITER).

138 and 169) and from La Ciénega in Catamarca (DEBENEDETTI, 8, pl. VIII, a and c). From this it must be inferred that the type of vessels in question in La Candelaria must have come into being under influence from the plateau regions. BRUCH (1, fig. 14) publishes a clay vessel from Tafi, which forms, so to speak, a transitional form between the asymmetrical clay vessels dealt with in the foregoing and the intercommunicating two-globe vessels we are here concerned with. The site where this vessel was discovered, Tafi, is situated in the northern part of the Province of Tucuman, and not far from La Candelaria, which gives colour to the supposition that the vessel belongs to the same culture as the other vessels we are at present concerned with. The vessel

in question consists of two parts, viz. one globe provided with a projection corresponding to the tail in the ornithomorphic vessels, and a second globe with an anthropomorphic ornament consisting of a relieved human face, and two legs in the lower part serving as supports for the vessel. On the neck of the vessel, opposite the relieved face, the handle is placed.

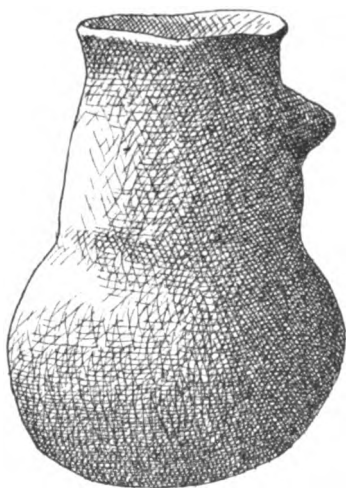


Fig. 97. Clay vessel from La Candelaria. (U. M. o. T.)

The intercommunicating vessel from La Candelaria on fig. 96 is provided with a tubular connection which is very narrow in proportion to the globes, while in the Tafi vessel the corresponding connection is of considerable width. In their work, «La Civilizacion Chaco-Santiagoña», E. WAGNER and D. WAGNER (pl. XIX) publish a vessel that as regards its shape corresponds to the one published by Bruch, but is provided with painted ornamentation and lacks the anthropomorphic decoration.

Vessel with two massive conical projections.

The clay vessel seen in fig. 97, is of greyish brown ware and especially characterized by the small protuberance on the outside of the vessel, seen to the right in the figure. Judging from a mark left on the surface immediately adjoining, and by the side of the projection, there may possibly originally have been two such protuberances. The height of the vessel is 10 cm., and all that is known of the circumstances in which it was found is that it was discovered in the department of La Candelaria inside a sepulchral urn containing bones of a very young individual. Wart-like protuberances of this kind just below the edge of the rim are

found on other vessels from La Candelaria, as for instance the fragment, fig. III, *j*. From Aimagasta, in La Rioja, BOMAN (2, fig. 24) depicts a similar vessel with a number of warts placed in a row below, and parallel to, the edge of the rim. This vessel is, however provided with an ear. In an archaeological site at Saipina Alta, in the Mizque valley, NORDENSKIÖLD found a fragment (G. M. 15.2.7) resembling the one depicted in fig. III, *j*. The fragment from the Cuchiyacu site in La Candelaria (fig. III, *q*) is provided with a ridge, recalling these wart-like bosses, placed below the edge of the rim. The Toba Indians in the Argentine province of Formosa sometimes provide their clay vessels to-day with a row of small protuberances below the edge and parallel to it (G. M. 33.1.233) and the same do also the Ashluslay Indians (NORDENSKIÖLD, 18, fig. 38).



Fig. 98. Clay vessel from La Candelaria. (U. M. o. T.)

Vessel with »pan»-handle.

The clay vessel seen in fig. 98, is made of greyish ware. It is 9 cm. high, and it originates from an unspecified locality in La Candelaria. In the place of handles, the vessel is on one side provided with a cylindrical, massive projection of earthenware, which probably did duty in the same way as the handle of a saucepan. Long and straight handles of this type we have already met with in the case of the lid of one of the sepulchral urns from Huanacocha (fig. 63). To this type of handle I shall recur in the following (p. 198).

Vessel of spherical form.

The vessel seen in fig. 99 is 28 cm. in height. The exact locality in the department of La Candelaria where it was discovered is uncertain. The ware is somewhat porous by reason of its having been very incompletely slip-finished. On the neck is an indefinable sort of ornamentation consisting

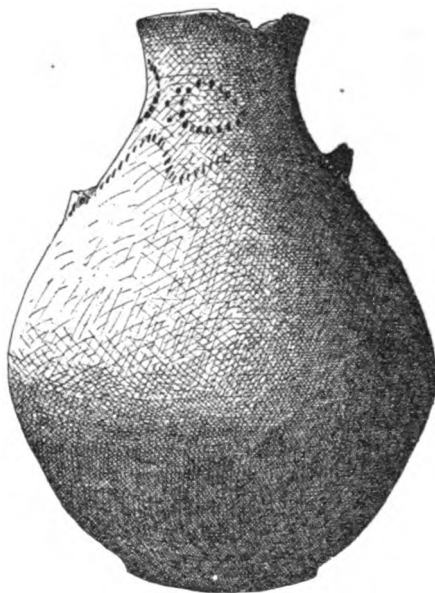


Fig. 99. Clay vessel from La Candelaria. (U. M. o. T.)

of dotted lines. The vessel also had some protuberances on its outer side, the shape of which however cannot be determined as they are only represented by some indistinct remains, as will be seen in the figure.

Zoomorphic vessels.

It must be admitted that the Indians who were the bearers of the La Candelaria culture were endowed with a vivid imagination in the matter of giving form to their clay vessels, as must already have become apparent from such types as

have been published in the foregoing. The two zoomorphic clay vessel that will just be discussed, as well as zoomorphic or anthropomorphous earthenware bowls that will be dealt with below, supply additional evidence on this point. A vessel of particularly fantastic shape is that seen in fig. 100, which I acquired at S. Pedro, a hacienda situated on the road between La Candelaria and the railway station Ruiz de los Llanos. Its shape is best seen from the illustration. A fragment bearing the representation of a face modelled on identical lines has been published by AMBROSETTI (2, fig. 165). According to him, it represents the head of a vampire. On the vessel that is here published, both zoomorphic and anthropomorphous ornamental details are discernible. The character of the anthropomorphous ornamentation points to the representation of a woman having been aimed at. On the front



Fig. 100. Clay vessel from S. Pedro, La Candelaria.

side of the vessel two wart-like protuberances can thus be made out — a woman's breasts — and at its lowest part a relieved circle which is probably meant to indicate the vulva. The two vertical, and somewhat projecting, ridges on either side of the vessel may be supposed to represent the arms. The fingers are indicated by a few vertical lines, and the portions corresponding to the upper arms and forearms are besides indented with a series of transverse, impressed lines. The rear portion of the vessel, which is slightly convex, is also ornamented with an incised field of rectangular shape. The vessel is of grey-black ware, and slip-finished on the outer surface. This vessel is probably one of the best examples we have of

ancient La Candelarian Indian fantastic inventiveness in the matter of pottery-shaping. What the shape of the present vessel was meant to represent is, however, impossible to say. Probably the artist had in his mind some imaginary animal, although its identification is impossible for the reason that no legends or myths relating to the Indians that in former times inhabited this section of Argentine are known. The fragment illustrated in fig. 111, *l*, is no doubt from a vessel similar to the one here depicted.

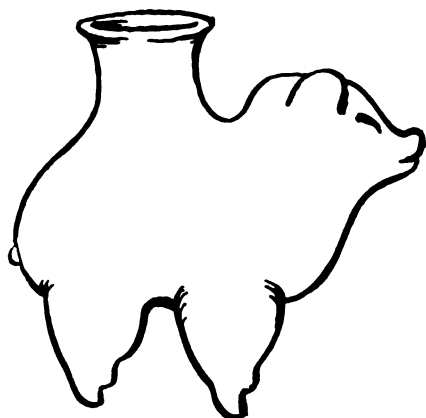
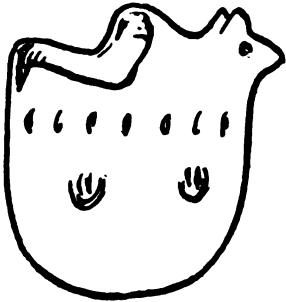


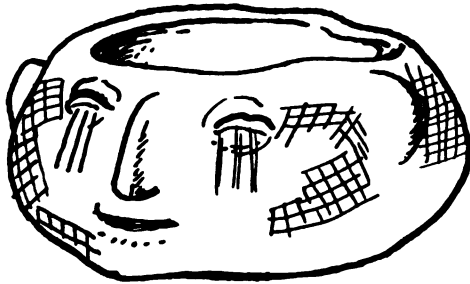
Fig. 101. Zoomorphic clay vessel from La Candelaria. Scale 1/3.
(After SCHREITER).

Of especial interest is the vessel fig. 101, because to some extent it supplies a landmark for dating the ancient La Candelarian culture. This vessel has already been illustrated by SCHREITER (1, fig. 16: 1). No particulars regarding it are given, but it appears to consist of the same kind of greyish ware as the remainder of the vessels here dealt with. If, as is supposed, this vessel represents a pig, it must necessarily have been manufactured in post-Columbian times. NORDENSKIÖLD (8, fig. 41: 14) depicts a vessel of similar shape from the Chiriguano Indians. I am, however, inclined to accept the vessel in question as a stylized representation of a dog, parti-

cularly as the shape of the head resembles that of certain dog-shaped vessels that have been recovered at Colima, in Mexico (G. M. 23. 6. 545). LATCHAM (p. 5), in his essay on the occurrence of the dog in America, states as his opinion that at the time of the discovery the dog probably did not occur in the Chaco. He mentions, however, that in Puna de Jujuy, and in Pucará de Rinconada, finds have been made that prove the pre-Columbian existence of the dog in this part of Argentina (LATCHAM, pp. 244—245), and it is therefore not improbable that it also existed in La Candelaria.



102



103

Fig. 102. Zoomorphic clay vessel from La Candelaria. Scale 1/2.
(After SCHREITER).

Fig. 103. Bowl with anthropomorphic ornamentation. Scale 1/2.
(After SCHREITER).

Some fragments that further illustrate the anthropomorphic and zoomorphic ornamentation on these vessels of grey-black ware are seen in fig. 111, *d*, *f-i*. Of especial interest is the anthropomorphic fragment *g*, on which the intercommunicating tubes run through the vessel wall at the points where the mouth and the eyes are placed.

Bowls with anthropomorphic or zoomorphic ornamentation.

Before passing on to the strictly bowl-shaped vessels with incised ornaments, I wish to draw attention to three bowl-shaped vessels that may be said to constitute a transitional type between the zoomorphic and anthropomorphic ves-

sels and the bowl-shaped ones just referred to, seeing that, apart from having incised decoration, they have been provided with zoomorphic or anthropomorphic ornamentation in relief. The three vessels in question, (figs. 102—104), have all been published by SCHREITER (I, fig. 15: 4 and 8; fig. 16: 9). Schreiter gives no particulars as regards the vessels, but, like the remainder of the finds here dealt with, they are no doubt made of some greyish kind of ware. The vessel seen in fig. 102 may be supposed to represent some kind of four-footed

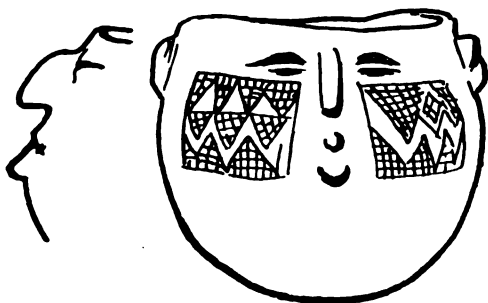


Fig. 114. Bowl with anthropomorphic ornamentation. Scale 1/3.
(After SCHREITER).

animal. The bowl in fig. 103 carries incised ornaments, and is provided with a human face executed in relief. Worthy of notice are the three lines that run down from each eye. As regards the anthropomorphic ornament found on the vessel in fig. 104, the strongly projecting chin is especially worth noting. This feature may possibly have been meant to indicate a beard. In that connection I shall recur to this vessel on p. 215.

Incised-ornamented bowls of greyish ware. Incised ornaments on bowls and larger clay vessels.

In the foregoing I have mentioned two sepulchral urns from La Candelaria, each containing a smaller clay vessel deposited as grave equipment. In one of these cases, that of a sepulchral urn from Santa Barbara (p. 55 and foll.), the grave

offering consisted of an earthenware bowl with beautiful incised décoration (fig. 28), and in the other, a sepulchral urn from El Paso de los Antiguos (p. 33 and foll.), it consisted of a bowl, the decoration of which was however limited to a pair of small rimbosses, fig. 14, c. Then there is the case of a sepulchral urn from Cuchiyaco (p. 26 and foll.) where the offering consisted of a large bowl provided with crescent-shaped ridge handles and the decoration typical of the large sepulchral urns, viz. the zigzag line below the edge of the rim (fig. 10). These smaller vessels that have been deposited as offerings possibly contained food or, even more probably, water. From what I have myself been told while visiting the Mataco Indians inhabiting a village near the present railway station ING. JUAREZ on the line Formosa-Embarcacion it was customary to deposit a clay vessel filled with water along with the dead in the grave. NORDENSKIÖLD (18, p. 316) mentions that when at Parapiti a Tapiete Indian was buried, a calabash filled with water was placed in his lap. As none of the smaller La Candelaria vessels known to me, that have been found within sepulchral urns — or reasonably might be supposed to have been thus placed — have been «killed» by knocking a hole through the bottom, it is possible that they have contained water. The custom of providing the dead with water as funeral provender may reasonably be supposed to have applied to regions where water was a matter of some consideration. I know of no authenticated instance of any funerary offering having been deposited outside the sepulchral urn. During the excavation of grave 9 at Huanacocha (p. III and foll.) it is true that fragments of two vessels were found outside the sepulchral urn, but whether the vessels in question had formed a funerary offering or were parts of broken up sepulchral urns I am unable to say. Where sporadic fragments of bowlshaped clay vessels have been found within sepulchral urns, as, e. g., in grave 1 of Caspinchango (p. 87 and foll.), they have probably been washed down into the urn by rain water. In La Candelaria funerary offerings are rarely found. As has

been mentioned in the foregoing, it is only in three instances that pottery of that kind has been found by me, and if the results of Professor R. SCHREITER's researches in La Candelaria be added thereto, it will not be wide of the mark to say that only about 10% of sepulchral urns contain grave equipment. An urn that was unusually richly endowed in this respect is described by SCHREITER (I, p. 58) from Santa Barbara. It contained four arrow-heads of obsidian, a very beautiful stone axe, 63 cylindrical stone beads of some green kind of rock, a small plate of mica, pieces of flint — probably used as scrapers — some fragments of calcareous rock, and, finally, a number of charred bits of wood. Probably there were also some grains of Indian corn in the urn. Another urn from the same site contained two small plates of mica, 14 cylindrical green stone beads, and some charred bits of wood.

By studying the ornamentation on the bowl-shaped vessels we are able to obtain a very good idea of the artistical decorative ability possessed by the people who were the bearers of the ancient La Candelarian culture, and at the same time acquire some degree of information as regards their intercourse with neighbouring tribes. Unfortunately only a small number of incised-ornamented clay vessels are preserved intact. On an earlier occasion I have had an opportunity of discussing vessels of that type belonging to the Tucuman University Museum (RYDÉN, I). Of these vessel we do not know for certain whether they were found inside sepulchral urns, but such is however most probably the case. Nor is it known from what localities the different vessels originate. For continuity's sake I shall below depict these vessels once more (fig. 105), and then give a brief description of them. The analysis of the ornamentation found on these bowl-shaped vessels I intend, however, to base for the most part on the fragments recovered in the various dwelling sites. The abundance of these fragments at the ancient dwelling sites goes to show that the vessels in question were meant for daily

use, and that their employment as grave offerings was of a secondary character.

The ware of which these bowl-shaped vessels are made is much the same as that generally forming the material of the large sepulchral urns. The only difference of any importance is that, in the case of these smaller vessels, the added ingredient of the clay, admixed for the purpose of preventing the vessels from cracking in the firing, consists of more finely powdered mica-schist than in the large burial urns.

Bowl-shaped clay vessels are manufactured by the same method as the large sepulchral urns, i. e. by building up the wall of the vessel with rolls of clay, laid one on top of the other. In different vessels the surfaces may differ somewhat in appearance, depending on the extent to which the vessels or fragments have been exposed to weathering, or the degree of care bestowed upon their firing or slip-finishing. Thus there can be distinguished certain vessels and fragments that are made of greyish black ware and more or less carefully finished with slip, while in others the surface is greyish brown, or brown, and frequently more porous. The latter is probably due to their finishing with slip having wholly or in part been omitted prior to the application of the incised ornamentation. Between these two groups no sharp boundary line can be drawn, and they will therefore here be dealt with together.

Beside the pottery just referred to, in La Candelaria were also found fragments of bowls made of a material resembling brick, and with surfaces of a beautiful reddish-brown, or brown, colour. In this case, too, the walls of the vessels have been given a slip-coating. Where incised ornamentation occurs, it corresponds to that of the grey-black ceramics. Fragments of brick-like ware are of much rarer occurrence than those of the grey-black ware, and of the former category I do not even know of a single intact vessel. Still more rare are fragments with painted decoration. Two intact vessels of this kind will be described below, and I shall also recur to fragments of brick-like ware with incised ornamentation.

All the bowls illustrated in fig. 105, as well as the fragments in figs. 106—108, are of the grey-black or brownish ware referred to above. Fig. 105 shows a number of the above-mentioned bowl-shaped vessels preserved in the Tucuman University Museum collections.

Fig. 105, *a*. A plain and unornamented clay vessel, with a grey-black, polished surface.

— *b*. The ornament encircling the vessel is just below the two rim-bosses interrupted by a field with small and triangular dots produced with the help of the edge of a small piece of wood. The inner sides of the two protuberances on the edge of the rim are ornamented with four vertical lines. The surface of the vessel is greyish brown, and porous.

— *c*. The band or ornamentation continues uninterruptedly round the vessel. The surface is black, here and there with a greyish tint.

— *d*. The two oppositely placed protuberances on the edge of the rim are ornamented with four lines running across the rim. Surface grey-brown and porous.

— *e*. The ornamentation seen in the right-hand portion of the vessel continues in the same design around it, with the exception of the break in its continuity seen to the left, where the cross is supplanted by the interpolation of some square fields and a rectangular one ornamented with dots. Surface brown-black and polished.

— *f*. Devoid of incised decoration; surface greyish brown, polished.

— *g*. Uninterrupted band of ornamentation all round the bowl. Grey-black, polished surface.

— *h*. The ornamental band round the bowl is in one place interrupted, as will be seen in the figure. The lines inside the band are only lightly scratched in the ware. Bottom inward-bulging. Surface grey-black and polished.

— *i*. Band of ornamentation of uniform design all through the preserved portion of the bowl. Surface grey-black and polished.

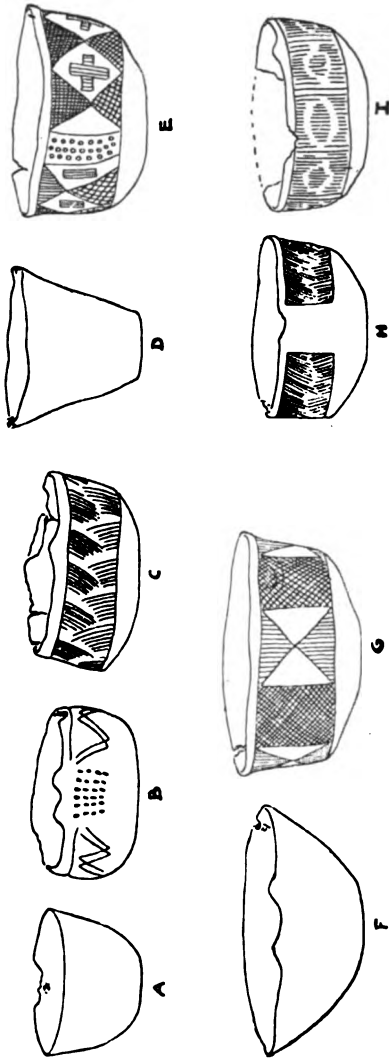


Fig. 105. Bowls from La Candelaria. Scale about $\frac{1}{4}$. (U. M. o. T.)

It is only in the case of vessel *b* above that anything is known as regards provenance. It is stated to have been discovered in a site near Aranda. It very frequently happens that when in La Candelaria local inhabitants come across a sepulchral urn they excavate it out of curiosity. If they then find a bowl inside it, they usually take it along, but leave the urn to its fate. Most of the bowls here above depicted probably originate from sepulchral urns left to be destroyed in this way.

Even by glancing superficially at these fragments and intact bowls one is able to divide them into two separate groups on the basis of their ornamental scheme. On one hand the incised decoration consist of single lines, as, e. g., the bowl in fig. 105, *b*, while on the other an artistic effect has been achieved by contrasting smooth and unornamented surfaces with fields filled in with dots, parallel lines, or a cross-hatching of parallel lines (fig. 105, *e* and *g*). In most cases there is in addition an express, incised, line of demarcation between the plain and the filled-in fields, as can be seen in the lastmentioned two vessels. This boundary line is absent in the band of ornamentation found on vessels *c*, *h* and *i* in fig. 105, where it has sufficed to demarcate the ornamental band with a line above and below. That any one of the decorative designs just referred to is especially confined to any particular vessel shape, quality of ware, or even burial site, it has not been possible to establish.

Ornaments were scratched in the moist clay after the surface of the bowl had been coated with slip. The lines were probably incised with a pointed wood splinter, a bone stylet, a cactus spine, or some other pointed instrument. Fragment fig. 106, *c*, consist of a small potsherd decorated with unusually fine lines, while *d* and *e* in the same figure illustrate two rim fragments with uncommonly thick lines. Occasionally a dry grass stalk or a tubular bone of small diameter have been employed in order to produce circular impressions in the clay instead of dots, as, e. g., on fragments fig. 107, *d*,

and 108, *d*. The ornamental design is severely geometrical. Engraved or painted figure representations are entirely absent on the La Candelarian finds, and curved lines or circles produced by methods other than those mentioned above are rarely found.

Ornamentation is generally applied as a band below the edge of the rim. The band of decoration is generally composed of some small, geometrical motive, rhythmically repeated all around the bowl. Where insufficiency of space made it impossible to carry out the decorative motif in its entirety at the end of the ornamental band, there has generally been put in a new figure which, without appreciably contrasting with the foregoing design, fills up the empty space that otherwise would have resulted. Of this, the bowl (fig. 28) from grave 1, Santa Barbara, is an example.

In the bowl-shaped vessels the thickness of the material varies between 3 and 10 mm., and their diameter from about 10 to 25 cm. The bottom is generally flat, but may occasionally be concave or convex.

The shape of a bowl and the presence of ornamentation appear to a certain extent to be interdependent. Thus, for example, bowls that are markedly conical in shape, i. e. with a bottom of small diameter in proportion to that of its mouth, and with straight walls, are hardly ever seen with any incised band or ornaments on the outside. On such vessels the decoration is usually limited to a pair of small rim-bosses, cf. fig. 105, *d* and *f*. Two types of profile are typical of vessels with band-ornamentation on the outside. One of these is represented by vessels with a comparatively small mouth diameter, while about half-way between the edge of the rim and the bottom the width of the vessel attains its greatest size, and gradually decreases towards the bottom. A profile of this type is seen in fig. 106, *f*. The profile most commonly occurring is, however, the one represented by the fragment seen in figs. 106, *ø*, and 107, *k*. The edge of the rim is more or less everted, while a straight — or

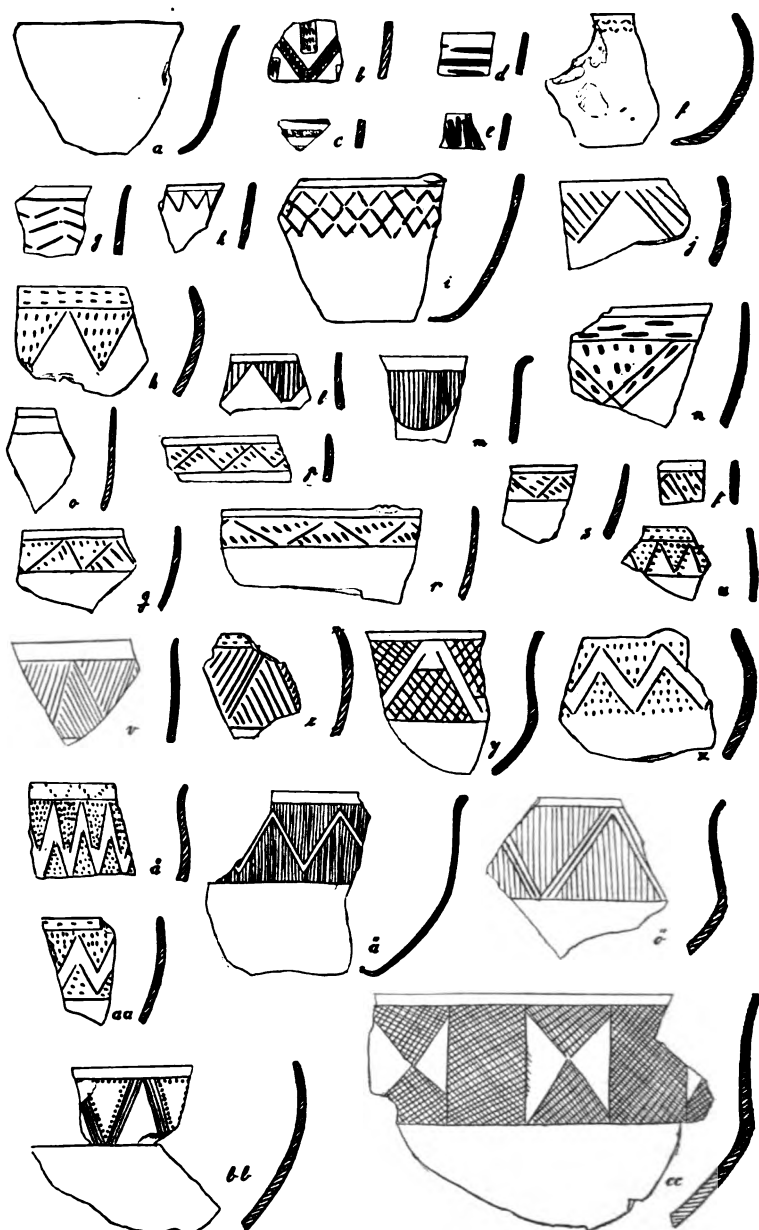


Fig. 106.

slightly convex — wall, with its transition into the bottom portion frequently marked, constitutes a typical feature of this profile. The demarcation between the wall and the bottom portion frequently coincides with the lower edge of the band of ornamentation, as, e. g., on the fragment seen in fig. 107, *i*.

All of the fragments illustrated in figs. 106—108 consist of surface finds from different sites, and constitute only a small proportion of the material collected. They nevertheless supply a very complete picture of the different ornamental designs. In comparing the fragments from different sites one cannot find that any given decorative design is confined to any particular site. Fragments of the type seen in, e. g., fig. 106, *p-u*, are thus found in almost every archaeological site in La Candelaria.

In fragment *bb* in fig. 106 we see a simple dotted line accompanying the design expressed by continuous lines. This ornamental detail occurs in several instances, as, e. g., on fragments *a*, *b* and *e* in fig. 107. A similar ornamental detail is illustrated in fig. 107, *g-h*, where the fields filled in with lines are bordered by dots or small circles in the place of continuous lines.

The majority of the sepulchral urns that are described in

Fig. 106. Fragments of bowl-shaped clay vessels, with incised ornaments., Scale 1/4. a. Agua Chica, (G.M. 33.15.580), b. Unquillo, (G.M. 33.15.435), c. Cuchiyaco, (G.M. 33.15.31), d. Cuchiyaco, (G.M. 33.15.13), e. Cuchiyaco, (G.M. 33.15.28), f. Cuchiyaco, (G.M. 33.15.1), g. Cuchiyaco, (G.M. 33.15.16), h. Cuchiyaco, (G.M. 33.15.24), i. Agua Chica, (G.M. 33.15.573), j. El Quebrachal, (G.M. 33.14.355), k. Caspinchango, (G.M. 33.15.550), l. Unquillo, (G.M. 33.15.414), m. Loma Blanca, (G.M. 33.15.599), n. Agua Chica, (G.M. 33.15.574), o. Unquillo, (G.M. 33.15.423), p. Unquillo, (G.M. 33.15.419), q. Unquillo, (G.M. 33.15.410), r. La Candelaria, (G.M. 33.15.674), s. Unquillo, (G.M. 33.15.416), t. Unquillo, (G.M. 33.15.434), u. Unquillo, (G.M. 33.15.413), v. Cuchiyaco, (G.M. 33.15.2), x. La Candelaria, (G.M. 33.15.672), y. Cuchiyaco, (G.M. 33.15.8), z. Caspinchango, (G.M. 33.15.553), á. Unquillo, (G.M. 33.15.403), ä. Caspinchango, (G.M. 33.15.552), ò. La Candelaria, (G.M. 33.15.673), aa. La Candelaria, (G.M. 33.15.601), bb. Loma Blanca, (G.M. 33.15.595 a), cc. Loma Blanca, (G.M. 33.15.594).

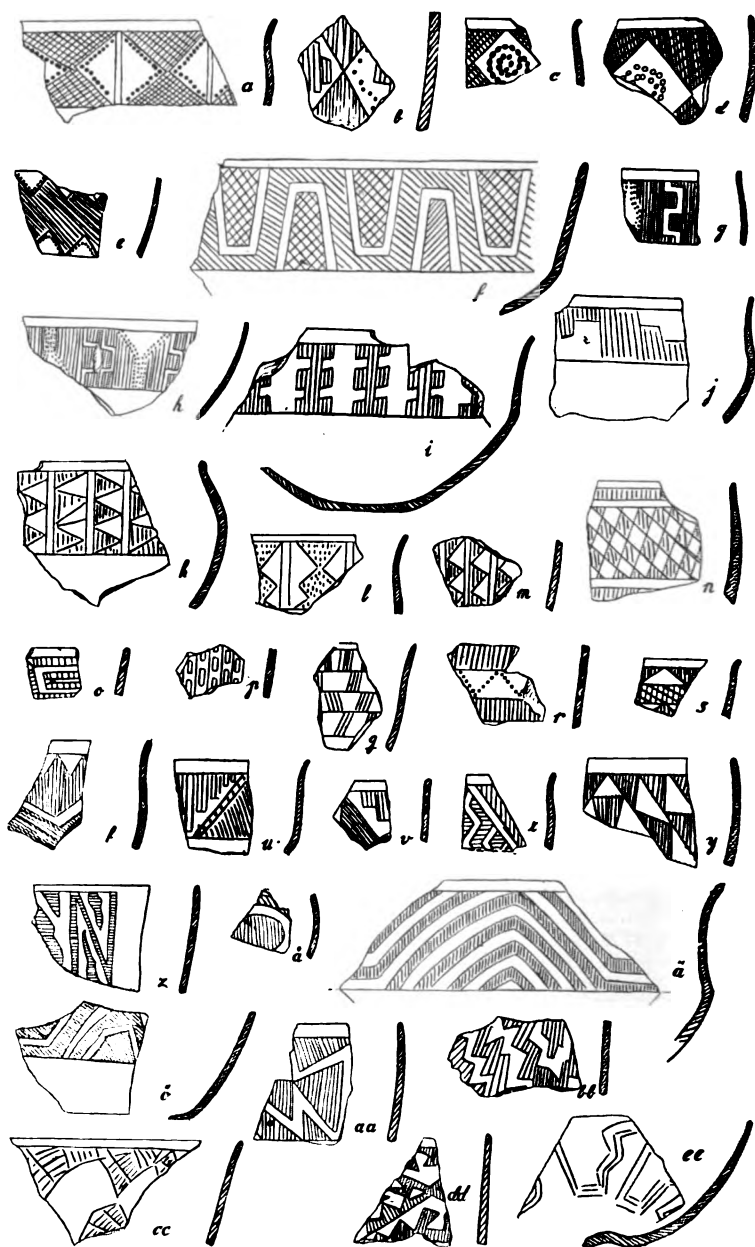


Fig. 107.

the foregoing are below the edge of the rim provided with one or more zigzag lines by way of decoration. In the scheme of ornamentation applied to bowl-shaped vessels this zigzag line appears in some form or other.

On the fragment seen in fig. 106, *f*, the zigzag line occurs in its original form. On fragments *g-i* in the same figure can be seen a beginning tendency towards delimitation of the ornamented area on the outer wall of the vessel in that here one of the two contour lines, viz. the upper one, has been drawn. The space between the rim of the vessel and this upper contour line, generally one centimetre wide, is mostly left unornamented. In cases where it has been thought desirable to ornament also this space, the decoration consist of dots, as is seen in the same figure, fragments *k, u, d* and *aa*. As I have already mentioned, the ornamental design is mostly based on contrasting plain fields with others that are filled in with lines or dots. This stylistic feature occurs on fragment *j*, adapted to the ornament usually found on sepulchral urns, viz. the zigzag line. Of this feature several variations are seen on fragments *k-n*. Fragment *m* is remarkable in so far as a curved line has there been used.

As may be gathered from the above, the idea is to give prominence to the ornamented area on the vessel by giving

Fig. 107. Fragments of bowl-shaped clay vessels, with incised ornaments. Scale 1/4. a. Cuchiyaco, (G.M. 33.15.5), b. Cuchiyaco, (G.M. 33.15.7), c. Cuchiyaco, (G.M. 33.15.9), d. Sta. Lucia, (G.M. 33.15.500), e. Cuchiyaco, (G.M. 33.15.14), f. Loma Blanca, (G.M. 33.15.490), g. Cuchiyaco, (G.M. 33.15.6), h. Unquillo, (G.M. 33.15.404), i. Loma Blanca, (G.M. 33.15.593), j. La Candelaria, (G.M. 33.15.677), k. Huanacocha, (G.M. 33.15.523), l. El Molino, (G.M. 33.15.383), m. Unquillo, (G.M. 33.15.422), n. Sta. Lucia, (G.M. 33.15.504), o. Cuchiyaco, (G.M. 33.15.26), p. Unquillo, (G.M. 33.15.439), q. Sta. Lucia, (G.M. 33.15.492), r. Loma Blanca, (G.M. 33.15.598), s. Cuchiyaco, (G.M. 33.15.15), t. Huanacocha, (G.M. 33.15.526), u. Agua Chica, (G.M. 33.15.575), v. Cuchiyaco, (G.M. 33.15.11), x. Cuchiyaco, (G.M. 33.15.25), y. Cuchiyaco, (G.M. 33.15.3), z. Caspinchango, (G.M. 33.15.551), ã. Cuchiyaco, (G.M. 33.15.22), ä. Sta. Lucia, (G.M. 33.15.491), ö. Sta. Lucia, (G.M. 33.15.501), aa. Unquillo, (G.M. 33.15.405), bb. Cuchiyaco, (G.M. 33.15.17), cc. Unquillo, (G.M. 33.15.406), dd. La Candelaria, (G.M. 33.15.678), ee. El Molino, (G.M. 33.15.382).

it a line of demarcation both above and below. A fragment on which these demarcation lines constitute the sole ornament is seen in fig. 106, *o*. On fragments *p-u* we see the zigzag line provided with these contour lines, and the space between them more or less irregularly filled in with short lines or dots. In this way an ornamental band on the vessels has been evolved.

On fragment fig. 106, *v* and *x*, parallel to the zigzag line, lines which wholly fill up the fields within the ornamental band have been drawn. The zigzag line itself became lost, and, in order to prevent its being obscured in the same way in the ornamentation on the potsherds depicted in the above figur, *y-bb*, the zigzag line has been doubled, while the space in between is left unornamented (fragments *y-ā, aa*), or else the zigzag line has been repeated in order to emphasize it (fragment *δ*).

Fragment *cc* in fig. 106 constitutes an excellent example of the style that is based on contrasting decorated fields with plain ones, and fragments *a-m* in fig. 107 show variations in this style. On these fragments the composition of the decoration is still fairly clear, although a certain tendency towards irregularity of pattern is noticeable. The zigzag line has disappeared, and ornamental details are often grouped about a perpendicular axis connecting the upper and lower lines of delimitation. Irregularities in the decorative scheme become more perceptible if the ornamental band is longitudinally divided, i. e. by inscribing additional lines between, and parallel to, the contour lines. Of this an example can be seen in fig. 107, *n*, where the ornamental band in addition consists of rhombic fields, some of which are filled in with lines while some are plain. Further examples of this are seen in fragments *q-s*. On fragments *o-p* the parallel lines are to some extent replaced by rectangles, and on fragments *t-y* even more bizarre forms of the geometrical design are seen. On fragments *z-ā* curved lines have come into use, while on fragments *δ-dd* geometrical partitioning has entirely disap-

peared, with only the upper and lower contour lines of the ornamental band remaining, and on fragment *ee* even these lines are absent.

In the above I have pointed out one or two instances where a row of dots has been placed within and parallel to one or more lines in the band of ornamentation, and expressed as my opinion that this stylistic feature pertains to cases where the

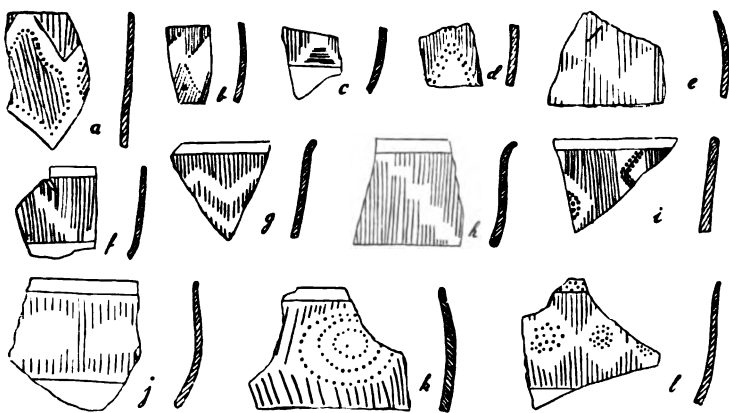


Fig. 108. Fragments of bowl-shaped clay vessels, with incised ornaments. Scale 1/4. a. Cuchiyaco, (G.M. 33.15.18), b. Cuchiyaco, (G.M. 33.15.27), c. Cuchiyaco, (G.M. 33.15.20), d. Cuchiyaco, (G.M. 33.15.23), e. La Candelaria, (G.M. 33.15.681), f. Unquillo, (G.M. 33.15.421), g. Cuchiyaco, (G.M. 33.15.4), h. Caspinchango, (G.M. 33.15.548), i. La Candelaria, (G.M. 33.15.682), j. La Candelaria, (G.M. 33.15.676), k. Unquillo, (G.M. 33.15.407), l. La Candelaria, (G.M. 33.15.679).

hatched fields are circumscribed by a single or double dotted line, or by a row of circles. Of this stylistic feature examples are seen on fragments *a*, *b*, and possibly also *k* in fig. 108, while on the rest of the fragments the hatched fields entirely lack contour lines. The decorative details we are here concerned with are also found on archaeological pottery from the Diaguita district. CASANOVA (fig. 25) depicts a vessel from Huiliche, in the department of Belén, province of Catamarca, on which the contour lines of the hatched fields consist of

continuous, or dotted, lines, and fragments similarly ornamented are depicted by LAFONE QUEVEDO (1, pl. I:1 and 10) from Andalgala. This ornamentation is also known from La Ciénega, in the province of Catamarca (DEBENEDETTI, 8, pl. VII, b).

If the clay vessel fragments here dealt with be compared with those from Pampa Grande published by AMBROSETTI (4, figs. 146—149), and moreover account be taken of the circumstance that at Pampa Grande Ambrosetti also discovered urn burials of adult individuals, in the dwelling site it must be concluded that a cultural connection must have existed between these two groups of finds. To this I shall recur later.

Further points of resemblance are to be found if we make comparisons with finds from the Diaguita district. By way of examples I may point to certain fragments from Andalgala (LAFONE QUEVEDO, 1, pl. I:6; II:1 and 3; III:10 and 15). These correspond most nearly with fragments *v* and *ā* in fig. 106. Annular impressions produced by means of a piece of grass or a tubular bone used as a sort of stamp are also found on finds from the Diaguita district (LAFONE QUEVEDO, 1, pl. III:2; BOMAN, 2, pl. II:1; BRUCH, 1, fig. 42; CASANOVA; figs. 38). This method was also known to the Comechingons (APARICIO, 3, fig. 27). In the Cauca valley, in Colombia, annular impressions also occur as an ornamental design on clay vessels (WASSÉN, pp. 46—47). With these exceptions this decorative detail does not appear to occur on the clay vessels of the Andine highland. On archaeological spindle-whorls from Peru this decorative detail is however often found, and its occurrence on the La Candelarian ceramics may therefore perhaps by rights be ascribable to influence from the highland. The idea of a simple stamp ornament like the one question is however very easily conceived, and one which is besides also employed in other connections, as, e. g., in the painting of bark-cloth dance masks on Rio Aiary, in Brazil (KOCH-GRÜNBERG, vol. I

fig. 65). Many points of resemblance as regards incised ornamentation are also to be found between the finds that are here dealt with and those published by DEBENEDETTI (8) from La Ciénega, in the province of Catamarca. Both also possess in common certain working methods for the execution of the ornamentation, as, e. g., the annular impression produced by means of a dry piece of grass, or tubular bone, and incised fields bordered by dotted lines (DEBENEDETTI, 8, pl. VII, b). The grave finds from La Ciénega are especially remarkable in that they present the »draconican style» that so far is only represented by a few, sporadic, objects with undefined locality data. This style is entirely absent in the La Candelarian finds, a matter which should be borne in mind in dating, as it is supposed to be the earliest style in northwestern Argentina (UHLE, 2, p. 514). Zigzag ornamentation resembling that seen on the fragment in fig. 106, *h*, also occurs in Comechingon pottery (GARDNER, figs. 22, 26—27), but the zigzag line, it must be admitted, is such a simple ornament that a comparison cannot justly be based only on that. Points of correspondence as regards incised ornaments are occasionally met with in the archaeological collections made by NORDENSKIÖLD in the San Francisco valley in north-western Argentina (R. M. collection 03.3. and NORDENSKIÖLD, 16, pl. 4). Among the finds from the San Francisco valley are also a few pottery fragments of bricklike ware with pointed decoration resembling those from La Candelaria (NORDENSKIÖLD, 16, pl. 4 : 1 and 23). It is however in the Pampa Grande finds that the closest parallels are found, those of the Diaguita district coming next.

The handle: its shape and method of affixing. Divers ornamented fragments.

Among the La Candelaria finds three different methods of affixing handles to clay vessels are represented. One method consists in cutting two holes in the wall of the vessel, and fitting the ends of the handle into these holes, the joints

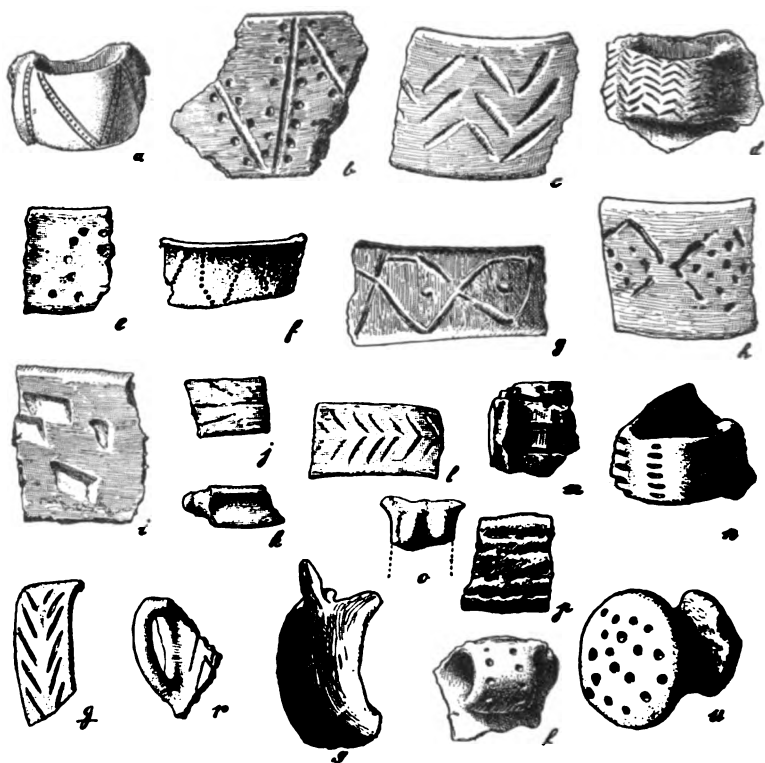


Fig. 109. Various types of handles from La Candelaria. a. Cuchiyaco. Width of handle 9 cm. (G.M. 33.15.230), b. Loma Blanca. Width of handle 6,5 cm. (G.M. 33.15.605), c. Agua Chica. Width of handle 5,5 cm. (G.M. 33.15.586), d. From an archaeological site near Aranda, same as in fig. 47. Width of handle 5 cm. (G.M. 33.15.653), e. Cuchiyaco. Width of handle 4 cm. (G.M. 33.15.233), f. Sta. Lucia. Width of handle 5 cm. (G.M. 33.15.508), g. El Quebrachal. Width of handle 4 cm. (G.M. 33.15.373), h. Unquillo. Width of handle 5,5 cm. (G.M. 33.15.447), i. Caspinchango. Width of handle 6 cm. (G.M. 33.15.562), j. Cuchiyaco. Width of handle 5 cm. (G.M. 33.15.232), k. Cuchiyaco. Width of handle 3 cm. (G.M. 33.15.238), l. Sta. Lucia. Width of handle 6 cm. (G.M. 33.15.509), m. Cuchiyaco. Width of handle 3,5 cm. (G.M. 33.15.235), n. Cuchiyaco. Width of handle 5 cm. (G.M. 33.15.231), o. Caspinchango. Width of handle 3,5 cm. (G.M. 33.15.242), p. Caspinchango. Width of handle 4 cm. (G.M. 33.15.563), q. Cuchiyaco. Height of fragment 10 cm. (G.M. 33.15.509), r. Cuchiyaco. Height of fragment 10 cm. (G.M. 33.15.236), s. La Candelaria. Height of handle 7 cm. (G.M. 33.15.692), t. La Candelaria. Height of handle 7 cm. (G.M. 33.15.693), u. Cuchiyaco. Diameter of boss 5,5 cm. (G.M. 33.15.243).

being then concealed with clay. Fragment *k* in fig. 109 shows the shape thus given to the ends of the handle. Another method consists of simply sticking the ends of the handle on to the outside of the vessel, the pressure thus applied frequently causing the thin wall to bulge inwards at the points of attachment. In order to make the handle stick on properly, as well as to soften the angle between the handle and the wall, a small quantity of clay is smeared round the joints. This method appears to have been employed especially in affixing handles to large clay vessels. When we come to the vertically set handles, referred to below, we notice yet a third method of affixing. On »jug»-handled vessels the upper end of the handle is affixed to the inner side of the vessel, either in immediate proximity to the edge of the rim or, as depicted by LINNÉ (2, fig. 32, b), on the top of it. The first of the above described methods corresponds to that illustrated by LINNÉ (2), figs. 32, c, and 33, and he states that, outside the Central American culture area, this method is known from Tiahuanaco as well as from the San Francisco Valley in northwestern Argentina. This method of fixing handles on clay vessels constitutes also a parallel between the finds from the Mizque Valley and those from La Candelaria (LINNÉ, 2, fig. 32, c). It is also known from the Comchingon district (GARDNER, fig. 34), and on a modern hanging vessel from the Toba Indians (G. M. 36. 28. 14) I have found that the handles are affixed in the same way. The occurrence of this method in La Candelaria, as also in other districts east of the Andine highland, is no doubt ascribable to influence from the last-mentioned region (LINNÉ 2, p. 174). The second — and more primitive — method of attaching handles is known throughout the entire area where it is at all usual to provide vessels with handles (LINNÉ, 2, p. 109; NORDENSKIÖLD, 6, map 39).

Fragments *o*, *q* — *t* in fig. 109 give examples of handles that are vertically placed. Especially worthy of note is the handle seen in *s*. A similarly shaped handle occurs on a

vessel, from La Ciénega (DEBENEDETTI, 8, fig. VI: a) and on three vessels that CASANOVA (figs. 21, 26 and 28) found at Huiliche, in the departement of Belén, prov. of Catamarca. Casanova besides depicts a series of handles showing how the small projection on the top of the handle has been given a variety of shapes on finds from the locality just mentioned. In addition to the two handles here depicted (fig. 109, *o* and *s*), where the projections may well be set down as incipient rim-bosses, may be mentioned the fragment seen in fig. 115, *d*, where the projection is of anthropomorphous form. Handles shaped like that seen in fig. 109, *s*, are besides known from La Rioja (BOMAN, 2, pl. XXIX, *g*). Vessels with this type of handle have also been found in a kitchen-midden at Casablanca, on the Chilean coast (OYARZUN, 1, figs. 8, 9, 11). SKOTTSBERG (1, fig. 32) also found vessels with handles of this shape in his excavations at Arica. They are even represented in Tiahuanacan culture (G. M. 31. 15. 12) and on the Tiahuanaco-influenced pottery from the Mizque valley, in Bolivia (G. M. 15.2.22, *a*). Two modern vessels in the Gothenburg Museum, one of them probably manufactured in the district of La Quiaca (G. M. 33. 1. 781) and the other from Calilegua (R. M. U. 28) are provided with this type of handle. In La Candelaria the handle type in question occasionally occurs on vessels manufactured by the present-day inhabitants, fig. 140, *a*. These handles are also known by the Mataco Indians (R. M. M. 83). A handle provided with two projections instead of one is found in ERLAND NORDENSKIÖLD'S archaeological collections from Tarupayo (G. M. 15. 2. 41). From all that can be ascertained it seems that this type of handle is confined to the highland region of western South America and adjoining regions. I only know of one instance outside this area, viz. a find from Arroyo de los Galpones, near Parana (SERRANO, 1, fig. 16). The projection on the handle probably served to afford a firmer grip of it by means of resting the thumb against the knob.

There is yet another form of vertical handle to be men-

tioned, viz. the spiral-twisted one. This is produced by twisting two rolls of clay together. A handle of this type is seen in fig. 115, *c*. This particular specimen is made of brick-like clay, but twisted handles are also found on La Candelarian archaeological pottery made of grey-black ware (fig. 93, *a*). It occurs on many of the vessels discovered at Pampa Grande (AMBROSETTI, 4, figs. 49, 51, 96, 106). Both the vessels from Pampa Grande that correspond to the finds here dealt with, and such as are of Diaguitan origin, are provided with handles of this type, DEBENEDETTI (8, pl. V:a) illustrates a vessel with this type of handle from La Ciénega, in the province of Catamarca. The anthropomorphous vessel in regard to which AMBROSETTI (1, pl. 1) supposes that the twisted handle represents a plait of hair no doubt belongs, however, to the same culture as the finds from La Candelaria. The vessel in question originates from the province of Tucuman. BOMAN (1, vol. I, pl. XVII, fig. 41) depicts from Pucará de Lerma a child's sepulchral urn with twisted handles. In ERLAND NORDENSKIÖLD's collections from the San Francisco valley twisted handles are also found (G. M. 16.2.36). In the case of another handle (R. M. 03. 3. 204) from the same locality an attempt has been made at imitating a twisted handle by engraving a spiral line round it, instead of producing the spiral by twisting two clay rolls one upon the other. SCHMIDT (1, pp. 228, 246) has depicted two archaeological vessels, one from Huacho and the other from Chancay in Peru, with similar handles, and RIVET and VERNEAU (pl. XXXVIII) a triple, intercommunicating vessel from El Angel, in Ecuador, with a spiral-twisted handle. A vessel from Lambayeque belonging to the Gothenburg Museum collections (G. M. 20. 9. 119) is also provided with a similarly constructed handle. Even in our days the Chané Indians still provide their clay vessels with spiral-twisted handles (NORDENSKIÖLD, 8, fig. 42:7). It seems that also this type of handle is confined to the high-land region of western South America and adjoining regions.

The zigzag line frequently occurs in some form or other as an incised decoration on the handles of sepulchral urns. No sepulchral urn with incised handles has, it is true, been found by me, but many of the fragmentary, incised handles that form part of my archaeological material from La Candelaria are of such massive proportions that they cannot very well have originated from vessels other than large sepulchral urns. Fig. 109, *a-j*, *l-n* shows a series of handles with incised ornamentation. All these handles were horizontally placed on the vessels, and, as will be seen, the zigzag line in most cases forms the basic idea of the ornamental design.

Incised-ornamented handles resembling those seen in fig. 109 do not, however, appear to be of common occurrence in Argentine archaeological pottery. It is only in the above-mentioned collection from the San Francisco valley that they are found. Two of the handles contained in this collection (R. M. 03. 3. . . . ? and 03.3. 7142) show correspondence with the fragments seen in fig. 109, *m* and *n*.

In this connection I may remark that from La Candelaria I know of no single instance of extended and up-turned handles resembling those occurring on many of the vessels that AMBROSETTI (4, figs. 47, 63—64) discovered in Pampa Grande. These finds are, as we know, those which in all other respects come nearest to the La Candelarian ones that we are here concerned with.

In fig. 109, *u*, is, lastly, seen a pottery fragment, ornamented with impressed dots, that has probably — as is apparent from the sepulchral urn lid, fig. 63, *b*, — served as the handle of a bowl. Similar fragments with identical decoration were found by AMBROSETTI (4, fig. 137) during his researches in Pampa Grande. The vessel seen in fig. 98 is provided with a lug-shaped handle, although in form it differs to some extent from the type here dealt with. These »pan»-handles also occur on finds of ceramics from La Rioja (BOMAN, 2, pl. XXIX: e). They are further found on Tiahuanaco-influenced pottery from the Mizque valley, in

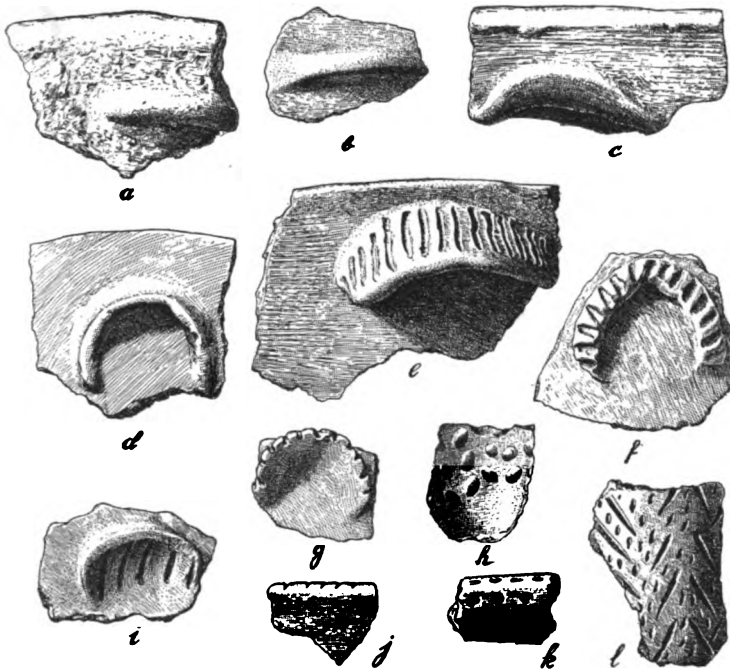


Fig. 110. Clay fragments. a—g, i, with crescent-shaped ridge handles.
 a. Cuchiyaco. Width of fragment 10,5 cm. (G.M. 33.15.224),
 b. Cuchiyaco. Width of fragment 7,5 cm. (G.M. 33.15.228),
 c. Cuchiyaco. Width of fragment 12 cm. (G.M. 33.15.221),
 d. Caspinchango. Width of fragment 10 cm. (G.M. 33.15.560),
 e. Cuchiyaco. Width of fragment 15 cm. (G.M. 33.15.219),
 f. Cuchiyaco. Width of fragment 9 cm. (G.M. 33.15.220), g. El
 Quebrachal. Width of fragment 5,5 cm. (G.M. 33.15.375),
 h. Cuchiyaco. Width of fragment 4,5 cm. (G.M. 33.15.205),
 i. Cuchiyaco. Width of fragment 8 cm. (G.M. 33.15.223),
 j. Cuchiyaco. Width of fragment 5,5 cm. (G.M. 33.15.208),
 k. Cuchiyaco. Width of fragment 5 cm. (G.M. 33.15.207),
 l. La Candelaria. Width of fragment 6 cm. (G.M. 33.15.671).

Bolivia. Two clay vessels (G. M. 15.2.23 A; G. M. 15.2.34) in ERLAND NORDENSKIÖLD's collections from the region just referred to, and preserved in the Gothenburg Museum, are thus fitted with this type of handle. Other similar parallels between finds from La Candelaria and the above-mentioned Bolivian region will be given in the following.

This lug-shaped handles may possibly constitute a development of the crescent-shaped ridge handle of which examples are seen in fig. 110, *a-g* and *i*. This primitive form of handle frequently only consists of a horizontal rib or ridge projecting from the side of the vessel, cf. fig. 110, *a-b*. This ridge is generally somewhat curved, so as to form a more or less complete semi-circle, as in fragments *c* and *d*. In most cases these handles are provided with some simple ornamentation, incised or impressed, as is illustrated in fig. 110, *e-g* and *i*. This primitive type of handle is found only on the bowl-shaped vessels of La Candelaria, and most frequently on bowls that have been used as lids on sepulchral urns. From Pampa Grande, too, this type of handle is known (AMBROSETTI, 4, fig. 135: 6 and 7), and such bowls as are occasionally found covering children's sepulchral urns in the Calchaqui valley are also provided with handles of this type. Other finds of this kind may be mentioned. BOMAN (2, pl. XXIX, h) depicts a fragment with a handle of this type from El Pantano, La Rioja; OUTES (3, fig. 14) illustrates another, while from the province of Salta (La Poma) the type in question is known through DILLENUS (1, fig. 15) and BOMAN (6, pl. XIV). Boman's finds originate from Tinti, in Valle de Lerma, and one of the crescent-shaped ridge handles is besides evidently composed by two rolls of clay twisted together, just as is the case with spiral-twisted handles proper. NORDENSKIÖLD found crescent-shaped ridge handles in the ancient site at Pulquina in La Franca, in the Mizque valley in Bolivia (G. M. 15.2.21, See p. 151), at Rio Palacio in the province Sara (NORDENSKIÖLD, 1, fig. 2) and at Yumbia (G. M. 15.2.45) in Bolivia, and again it occurs in his archaeological collection from the Guarayos (R. M., collection G). He also found this handle type in Mound Hernmarck (NORDENSKIÖLD, 1, fig. 101). A modern vessel for holding maize beer, from the Chiriguanos, is provided with a crescent-shaped ridged handle (NORDENSKIÖLD, 8, fig.

45:6), but there the arch is double \frown , instead of being single \smile , as in the present case. This constitutes the only instance known to me of this primitive handle-type occurring on a vessel of modern every day use.

A further two fragments are depicted in fig. 110. Fragments *j* and *k* show two different types of ornamentation, which are applied to the rim of the vessel, while fragments *h* and *l* show variations of the zigzag line as an ornament of the neck region of a clay vessel.

Nearly all of the fragments seen in fig. 111 have already been discussed. As regards fragment *k* it may, however, be remarked that the annular impression was probably made by means of a tubular bone. From fragments *m*, *o*, *p* and *r* can be seen how projecting ridges on the side of vessels are decorated. A sepulchral urn on which the waist is defined by a ridge of an appearance similar to that seen in fig. 111, *p*, was found by AMBROSETTI (4, fig. 68) at Pampa Grande. Certain points of correspondence with this form of ornamentation are presented by the sepulchral urn seen in fig. 46 as well as in fig. 80, where the ridge, so to speak, has been divided up so that the waist is defined by a row of cupular, wartlike protuberances. Ridges resembling fig. 111, *r*, are occasionally found on modern Chiriguano clay vessels (NORDENSKIÖLD, 8, figs. 40:2 and 41:17).

In fig. 112 are illustrated a series of fragments with anthropomorphous decoration. What type of vessels these fragments originate from is uncertain. As all these fragments, with the exception of *a* and *b*, are made of massive ware, it is not impossible that at all events the latter constitute lug-shaped handles to which anthropomorphous ornamentation has been applied. Fragments *a* and *b* are hollow, and in fragment *a* a passage runs right through the wall of the vessel at the point where the mouth of the ornament is placed. A similar passage or channel is found in the crown of the head of the anthropomorphous figure. Fragment *b* may possibly constitute a swelling of the same

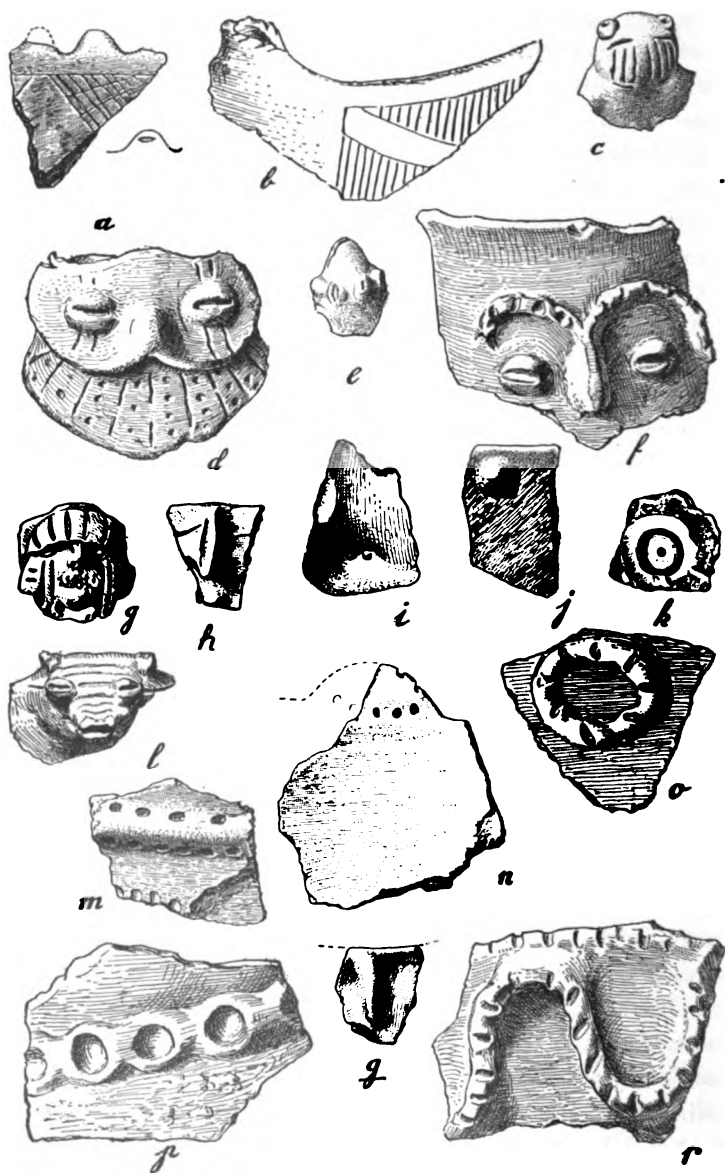


Fig. 111. Various clay fragments. a. Cuchiyaco. Height of fragment 5 cm. (G.M. 33.15.12), b. Sta. Lucia. Width of fragment 11 cm.

kind as those depicted in fig. 82. Both these fragments, as well as the two next following, are made of clay in which the added ingredient is finely powdered. There is a surface coating of slip. In the other three fragments the admixture is more coarse-grained and the slip-finish of inferior quality. In section, fragments *c*, *d* and *g* are round, and fragments *e* and *f* from square to oval.

In the foregoing I have once or twice drawn attention to points of correspondence between finds from the Mizque Valley in Bolivia, and those here dealt with from La Candelaria. A further striking detail of resemblance between the two groups is found in the anthropomorphous of the fragments here dealt with. In fig. 113, fragments *a* (G. M. 15. 2. 3) and *b* (G. M. 15. 2. 3) constitute finds from the Mizque Valley; fragments *c* (G. M. 33. 15. 691) and *d* (G. M. 33. 15. 267) originate, respectively, from Toro Loco and Cuchiyaco, in La Candelaria, and fragments *e* and *f* from Pampa Grande (after AMBROSETTI, 4, figs. 44 and 45). The resemblance that all these fragments bear to each other is plainly manifest. When comparison is made with corresponding finds from the Diaguita district, divergencies nevertheless obtrude themselves. The Diaguita finds as a rule present indicated eyebrows that form the continuation of the nose, and the design of the eyes, too, is different. Whether there actually

(G.M. 33.15.506), c. Unquillo. Height of fragment 4 cm. (G.M. 33.15.450), d. La Candelaria. Height of fragment 7 cm. (G.M. 33.15.689), e. El Quebrachal. Height of fragment 3 cm. (G.M. 33.15.368), f. La Candelaria. Height of fragment 7 cm. (G.M. 33.15.690), g. Cuchiyaco. Height of fragment 4 cm. (G.M. 33.15.268), h. Cuchiyaco. Height of fragment 4 cm. (G.M. 33.15.266), i. Cuchiyaco. Height of fragment 5 cm. (G.M. 33.15.267), j. Caspinchango. Height of fragment 5 cm. (G.M. 33.15.558), k. Cuchiyaco. Height of fragment 3 cm. (G.M. 33.15.210), l. Sta. Isabel. Height of fragment 4 cm. (G.M. 33.15.329), m. Cuchiyaco. Height of fragment 5 cm. (G.M. 33.15.211), n. Cuchiyaco. Height of fragment 8 cm. (G.M. 33.15.215), o. Agua Chica. Height of fragment 6 cm. (G.M. 33.15.581), p. Angosto. Height of fragment 7 cm. (G.M. 33.15.706), q. Cuchiyaco. Height of fragment 3 cm. (G.M. 33.15.264), r. Unquillo. Height of fragment 8 cm. (G.M. 33.15.612).

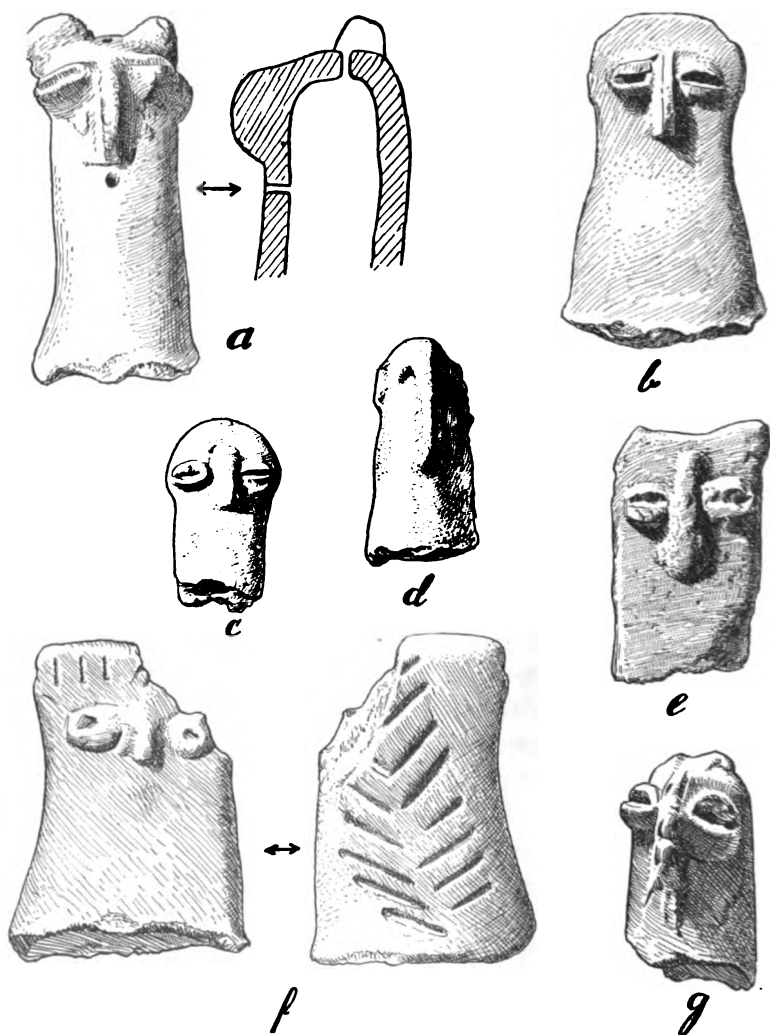


Fig. 112. Lug-shaped fragments with anthropomorphic ornamentation.
 a. Agua Chica. Height of fragment 10 cm. (G.M. 33.15.589).
 b. La Candelaria. Height of fragment 9 cm. (G.M. 33.15.683).
 c. Cuchiyaco. Height of fragment 5,5 cm. (G.M. 33.15.269).
 d. Cuchiyaco. Height of fragment 6 cm. (G.M. 33.15.270).
 e. Toro Loco. Height of fragment 9 cm. (G.M. 33.15.391).
 f. La Candelaria. Height of fragment 9 cm. (G.M. 33.15.686).
 g. La Candelaria. Height of fragment 7 cm. (G.M. 33.15.687).

existed a cultural connection between the Bolivian region just referred to and the culture forming the subject of the present treatise is a question difficult to determine on the basis of the material hitherto available. A great deal, however, seems to speak in favour of such supposition.

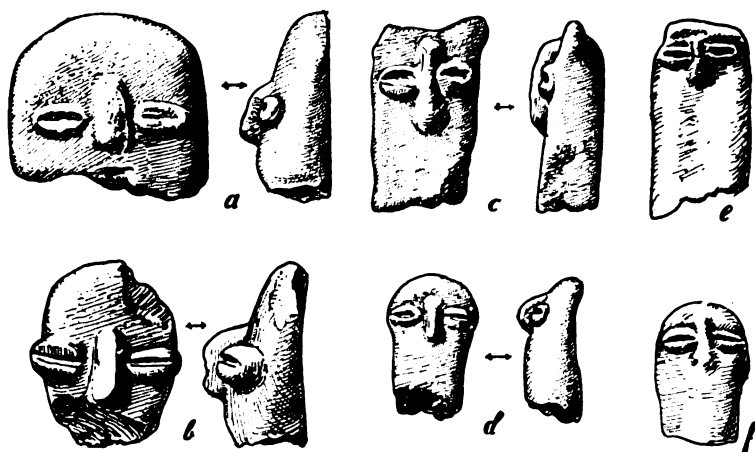


Fig. 113. Lug-shaped fragments with anthropomorphous ornamentation. a and b from the Mizque-valley, Bolivia; c and d from Toro Loco and Cuchiyaco, La Candelaria; e and f from Pampa Grande. Scale about $\frac{1}{4}$.

Post-Columbian clay vessels.

In fig. 114, *a* and *b*, are depicted two clay vessels which, both as regards material and surface-finish, differ from those described above. Thus the ware is of a bright brown colour, in which respect it presents a certain degree of resemblance to the brick-like ware that will be described below. The sides of the vessels are striated on the surface, and the character of the striation marks indicate that the vessels were thrown on a potter's wheel. According to the persons from whom I bought the vessels, they were found on the surface of the ground, near the farmstead of S. Pedro mentioned on p. 175. The height of the vessels are 15 and 12 cm., respectively. As the probability of the vessels being

wheel-manufactured practically amounts to a certainty it follows that they are post-Columbian.

The third vessel, *c*, appearing in the same figure shows much resemblance to the two foregoing, although with less marked striation. Its height is 14 cm. This vessel belongs to the La Candelaria collection found in the Tucuman University Museum.



Fig. 114. Three La Candelarian clay vessels, probably post-Columbian- (G.M. 33.15.662—663 and U. M. o. T.).

Vessels and fragments of brick-like ware with incised or painted decoration.

In the foregoing it has been mentioned that in association with incised-ornamented bowls and other small clay vessels from La Candelaria, made of grey or grey-black ware, were found vessels and fragments of different appearance in regard to material and surface-finish. In this case the ware is of yellowish brown or reddish brown colour, recalling in some degree an ordinary brick, and I am therefore simply referring to it as »brick-like». In cases where its thickness exceeds 5 mm. its heart often assumes a blue-black tint. Vessels consisting of this ware are, like those of the grey-black material, given a coating of slip. In exceptional cases slip has not been applied to the entire surface of the vessel, and as the slip-coating is generally of a

darker colour than the ware itself, a contrast effect has been obtained. Thus it is conceivable that coating clay vessels with slip constitutes an early stage of ornamentation by painting. On La Candelaria painted pottery the slip-coating is of a yellowish, or reddish, brown colour, while the painted ornamentation is of a darker shade of brown. As to the relative occurrence of archaeological finds of brick-like and grey-black ware, respectively, it may be mentioned that in La Candelaria the former occur much more seldom.

In fig. 115 are depicted a number of fragments of brick-like ware, of which the surfaces are wholly or in part coated with a skin of brown or brown-red slip.

— *a*. A rim fragment. The edge is inward-curving, this inversion being on the outer side bounded by two bulges in the material. The surface has been given a particularly elaborate finish in that the reddish slip forms a glaze-like coating of the whole of it. At the edge to the right in the picture the surface of the fragment, both on the outer and the inner side, is of a dark colour bordering on black, probably owing to some fault in the firing. The height of the fragment is 8 cm. Provenance, Unquillo. (G. M. 33. 15. 629).

— *b*. Rim fragment, from Unquillo, height 2.5 cm. The ornamentation corresponds, as will be noticed, largely with that found on certain fragments of the grey-black ware in that it contains the zigzag line, in a modified form below the edge of the rim. (G. M. 33. 15. 293).

— *c*. Spiral-twisted handle, composed of pair of twisted clay rolls. This is the only instance known to me of this type of handle occurring in brick-like ware. A number of similarly constructed fragments of grey-black ware have on the other hand been found in various ancient sites. The height of this fragment is 8 cm. Provenance, Cuchiyaco. (G. M. 33. 15. 288).

— *d*. Anthropomorphous rim-boss. Below the chin of the figure is a scar which makes it probable that the boss had its place at the point where the handle of the vessel was

joined to the rim. In that case the face was turned outwards. The slip-coating is of an unfinished character. The object was found at Cuchiyaco. It is 2.4 cm. high. (G. M. 33. 15. 296).

— *e*. Rim fragment, with incised ornamentation. Its surface coating is of a dark red colour, and its height 2.4 cm. Provenance, Unquillo. (G. M. 33. 15. 472).

— *f*. The bottom portion of a large bowl with incised decoration. The actual bottom is concave, its curve beginning just at the lower edge-line of the band-like ornamentation. The slip-coating is dark red with occasional lighter shades, especially on the outer side of the bottom. The inner side of the vessel is only partly covered with slip, so that the brick-like colour of the ware can be seen. At its widest part the fragment measures 13 cm. across. Provenance, Unquillo. (G. M. 33. 15. 471).

— *g*. Small fragment with irregular, incised ornamentation. It measures 3 cm. across its widest part. Provenance, Cuchiyaco. (G. M. 33. 15. 294).

— *h*. Rim fragment. Before finishing with slip, a series of evenly spaced lines has been impressed athwart the edge of the rim. Width, 3.5 cm., provenance, Huanacocha. (G. M. 33. 15. 538).

— *i*. Rim fragment of a vessel which apparently was cupshaped. Height, 13 cm., provenance, Unquillo. (G. M. 33. 15. 457).

— *j*. Rim fragment of a bowl with beautiful incised ornamentation. The edge of the rim is provided with a boss. Height, 6 cm. Its exact provenance in La Candelaria is not known. (G. M. 33. 15. 697).

— *k*. A fragment from Cuchiyaco with reticulate ornamentation. The ornamented portion of the fragment shows the brick-like colour of the ware, while the unornamented portion in the lower part of the fragment has been finished with a slip-coating of a darker, reddish colour. Height, 5 cm. (G. M. 33. 15. 291).

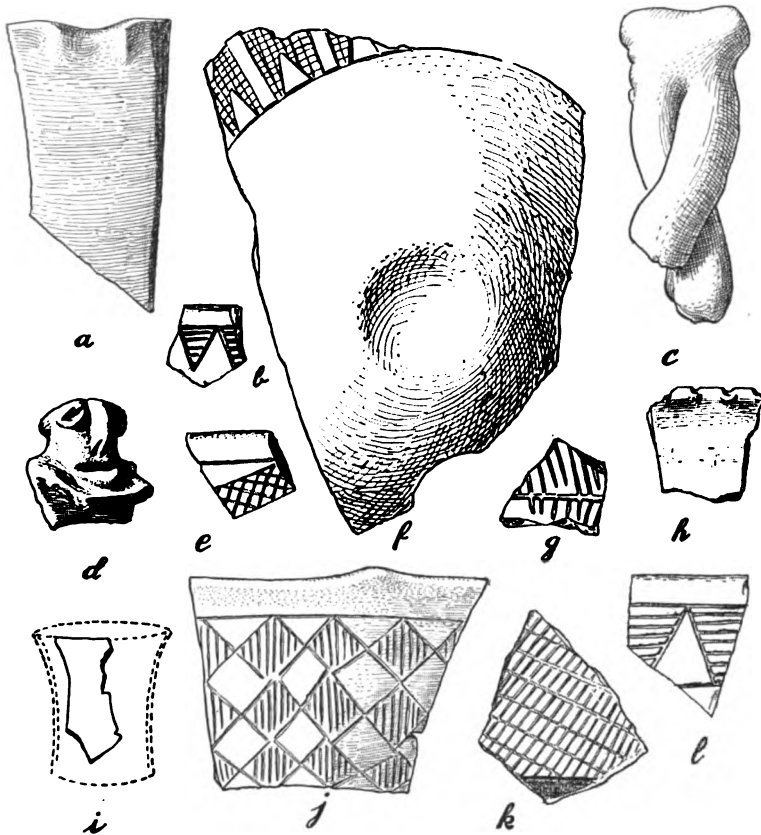


Fig. 115. Fragments of vessels of brick-like ware, from various archaeological sites in La Candelaria.

— *l*. Rim fragment with incised ornamentation, from Cuchiyaco. Height, 4 cm. (G. M. 33. 15. 292).

In addition to the few ornamented or unornamented fragments enumerated above, in practically every ancient site one or two unornamented fragments of brick-like ware and with reddish-brown slipcoating were discovered, which have not been depicted here. In those of which illustrations are given, the incised decoration has been applied after

coating the surfaces with slip, a method we have already met with in the case of the grey-black pottery. The fragments are so few in number, and in such a poor state of preservation, that as regards ornamentation no close comparison can be made with the bowls or fragments of grey-black ware with incised ornamentation. No important divergences in regard to manufacture or shaping can, however, be established between the two pottery groups. Two bits of evidence proving that the pottery here dealt with is of purely La Candelarian origin may be mentioned. For one thing, the spiral-twisted handle, as has already been pointed out, is common to the brick-like pottery and the grey-black ware, and for another, vessels of the type here represented in fig. 81, *a* and *b*, have also been manufactured in brick-like ware. This is proved by a fragment found at Cuchiyaco, resembling that seen in fig. 82, *b*, although lacking the small ridge, which is made of brick-like ware. Its surface is coated with a reddish layer of slip. The cup-shaped vessels also appear to have been common to both these groups of pottery.

The two fragments seen in fig. 116, *a* and *b* (G. M. 33. 15. 626 and 461), show the colours that most commonly occur on painted ceramics. Fragment *a* constitutes one-third of a bowl. Its rim, as will be seen, is provided with two bosses which are placed side by side. The material is one centimetre in thickness, and its heart is of a darker shade of colour. This fragment, which has a height of 10 cm., was found — broken into several pieces — in one of the test shafts that was sunk at Unquillo (p. 127). Its main ornament is disposed in the fashion of a band encircling the outside of the vessel. In this ornamental band the slip-coating is of a yellowish-brown colour, on which the ornament, which in this case also consists of a modified form of the zigzag line — is painted in dark brown. The lighter-coloured slip-coating — the grund for the painting — has come away in places, so that the more



a



b

Fig. 116. Two fragments of brick-like ware with painted ornamentation.
Unquillo, La Candelaria. Scale 2/3.

greyish tint of the ware shows through. The entire bottom portion is coated with paint of the same kind as that used in the ornamentation. The inside of the vessel is coated with reddish-brown slip on which vertical lines, parallel and one centimetre broad, have subsequently been painted in a somewhat darker shade. The rim has the same coating of slip as the inside. The inner side of the bottom portion is partly eroded from weathering. This vessel is typical of the painted ware in so far as the coat of paint last laid on is darkest in colour. I do not know even a single instance from La Candelaria where a lighter paint has been applied on darker ground.

In *b* are seen two fragments of a painted bowl, originating from the same locality as the foregoing. Its maximum height is 8 cm., and its thickness 3 mm. In this case the ground is provided by the colour of the ware itself, while the ornamentation, which consists of lines and dots, is of a brownish colour. The darker colour-shade observable in the right hand fragment is probably ascribable to unevenness of firing.

Vessels showing resemblance to those here depicted have been published by BRUCH (1, fig. 46) and LAFONE-QUEVEDO (2, p. 43, fig. 5, f). The vessel illustrated by Bruch came from Fuerte Quemado, in the province of Catamarca, and its ornamentation differs from that of the fragment here seen in fig. 116, *a*, in so far as rows of dots have been placed between the zigzag lines. The vessel that Lafone-Quevedo illustrates, originating from Chanar-Yaco, also resembles that in fig. 116, *a*. In regard to the vessel depicted by him, Lafone-Quevedo says that it, and one or two others, differ from the rest of the Chanar-Yaco finds by their superior quality, which make him inclined to believe that these vessels belong to an earlier culture than the others, and that their association with the latter point to their (the finer vessels) having been put to some secondary use. A similar decoration occurs on the inner side of a clay bowl fragment from the province of San Juan (DEBENEDETTI, 3, fig. 71). Between

the two rows of opposed triangles in this fragment there are dots instead of lines. As regards comparisons of this latter kind it may be pointed out that these — as always, when archaeological finds of painted ceramics are compared — are beset with considerable difficulties, since from illustrations one is able to obtain exact knowledge only of the design, but not of the appearance of the colours or the ware itself.

Two intact, painted vessels, which besides are of anthropomorphic or zoomorphic form, belong to the Tucuman University Museum collections. Both of them have already been illustrated by MÉTRAUX (3). One of them, fig. 117, *a*, represents a pair of copulating llamas. The painted decoration consists of dots, lines and circles, disposed on the vessel without any regard to indicating any particular anatomical detail in the figure. The paint used in ornamentation differs only very slightly from the colour of slip with which the vessel is coated, and can therefore only with some difficulty be made out. The tuft of hair depending from one of the ears of each animal, as well as body orifices and the lower part of the feet, are represented by means of incised lines. Faint traces of a darker colour are discernible in the eyes and ears of the upper animal. Under what exact circumstances this vessel, as well as that depicted in fig. 117, *b*, was found is not known, only that they were discovered in the department of La Candelaria. The quality of the ware, and also the colour of the slip-coating, is generally speaking identical with that of other brick-like La Candelarian pottery. The figure representation as such on the other hand recalls the Peruvian effigy vessels where sexual intercourse constitutes a frequently recurring motive (SCHMIDT, I, p. 180, and 2, p. 451, fig. 5, *b*). Of interest, too, is the tuft of hair hanging from one ear in each animal in that it provides a clue to the local origin of the vessel in question. In an essay dealing with certain conceptions among the Indians of the Bolivian highland, MÉTRAUX (I, p. 72) explains the presence of this feature. He writes:

"Les *kabilto* son des esprits masculins tandis que les *torrentes* sont féminins. Ce sont des ombres, des fantômes qui se posent le mardi ou le vendredi sur les *apaceta* (tas de pierres sacré). La chique de coca que les voyageurs ont coutume de lancer sur les *apaceta* est une offrande qui leur est destinée. Malheur au passant distrait qui néglige ce rite; ces esprits le poursuivront, lui feront peur et, d'épouvante,

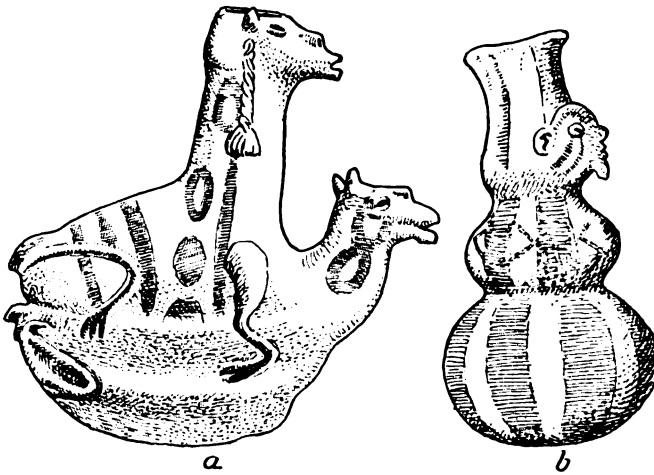



Fig. 117. A zoomorphous and an anthropomorphic vessel with painted decoration from La Candelaria. Scale about $\frac{1}{3}$. (U. M. o. T.)

son âme s'enfuira. La perte de l'âme entraîne une maladie immédiate, et si son absence se prolonge, la mort.

C'est également en hommage à ces esprits que les Indiens ornent de touffes de laine rouge (kilpa) les oreilles de leurs lamas».

The llama, as I have already pointed out (p. 127), is unlikely to have existed, otherwise than quite exceptionally, in ancient La Candelaria, as the climatic conditions of that region would have been forbidding. Since that time the climate cannot have altered to any appreciable extent. For it may be noted that the bearers of the culture we are here

concerned with based their domestic economy on maize cultivation, which means that climatic conditions were then much the same as they are to this day. The theme represented in this vessel, together with the minor detail of the tuft of hair depending from one ear of each animal, points to the possibility of importation from the highland regions. In spite of this, however, it is no doubt of local origin, and possibly manufactured in imitation of some vessel from the highland. What lends colour to this theory is the nature of the material of which it is made, as well as the rustic character of its workmanship as compared, e. g., with that seen in vessels of this type from the highlands, the latter almost without exception being provided with a stirrupshaped handle , which also serves as a spout.

The second vessel, fig. 117, *b*, as is seen from the illustration, is, provided with two waists, that is to say, it has been built up in three spherical parts, one placed on top of the other. The uppermost globe is somewhat elongated, by means of which the vessel has been provided with a neck, and this part of it has been given anthropomorphous ornamentation, excuted in relief. The painted ornamentation consists of a series of vertical bands, four on each of the two upper globes, and seven on the bottom one. On the middle globe these bands are besides connected by means of zigzag lines. Two lines that in the human figure run slantwise from the eyes down the cheeks possibly represent face-painting or »tears». As is seen from the illustration, the human face is provided with a chin-beard. The ware is brick-like, but not of such fine quality as in the foregoing. The painted ornamentation is done in brownish-red colour, while the ground, i. e. the slip-coating, is greyish brown. Of especial interest is the circumstance that the human figure modelled on the vessel is bearded. The vessel in question is not the only one of its type from La Candelaria. SCHREITER (1, fig. 15: 8) publishes an anthropomorphous vessel from this region with a similiar figural representation (fig. 104). An

earthenware figure representing a man in a sitting posture and with a bearded face is depicted by QUIROGA (I, fig. 27). It was discovered at Lules. Still another similar figure, with unspecified provenance, is depicted along with it. Professor A. Métraux has drawn my attention to a passage occurring in a letter from ALONZO DE BARZANA (p. LV), written in 1594, containing a remark on Indians from the neighbourhood of Tucuman, who "are bearded like Spaniards". Indians, as we know, are very rarely found wearing beards, and the exception from this rule evidently struck the Spaniards as remarkable. In pre-Columbian times, if we may judge from the ceramics, beards were only very rarely worn by the Indians of Peru. MONTELL (I, fig. 17) it may here be mentioned, depicts a clay vessel modelled in the form of an Indian with a long chin beard. Similar vessels have been published by SCHMIDT (I, p. 143) and LEHMANN and DOERING (p. 26).



Fig. 118. Anthropomorphic vessel from La Candelaria. (U. M. o. T.)

An anthropomorphic clay vessel that may be mentioned in connection with those referred to above is seen in fig. 118. This vessel, which is 12.5 cm. high, is of brick-like ware, the surface being in parts coated with a greyish red-brown skin of slip, by reason of which it can neither be classed with the grey-black pottery nor with the brick-like category that is entirely coated with reddish-brown slip. In this vessel, nose, eyebrows, eyes, arms and legs are executed in relief, while the hollows of the eyes, the mouth and the fingers are indicated by impressed lines. On the back of the vessel has been cut a vertical groove, one centimetre in width, representing the mid-dorsal furrow.

Supplementary to the section devoted to the painted ceramics, an additional number of fragments are here illustrated in fig. 119.

— *a*. Fragment of a vessel, probably anthropomorphous, or zoomorphic, seeing that an ear in relief is discernible on it. The slip-coating is of a greyish brown colour and painted with a number of lines, some of which are black and others of a colour somewhat darker than that of the slip. Provenance, Cuchiyaco. (G. M. 33. 15. 298).

— *b*. Fragmentary figure of a woman. The torso is hollow, while the lower portion of the legs is massive. The leg that is in the better state of preservation, although the foot is missing, is bent back so as to make the figure appear to represent a running woman. The slip-coating is brownish red. On the front of the figure are with difficulty discernible two lines of a darker brown colour, running obliquely down the torso. Provenance, Cuchiyaco. (G. M. 33. 15. 297).

— *c*. Foot of a clay figure, found at Huanacocha. From what can be seen, no other finish has been given to the surface than a dark-brown band, one centimetre in width, painted on the front side of the foot. (G. M. 33. 15. 539).

— *d*. Rim fragment, with boss. Probably there was originally a second boss close beside the one that is preserved. Between the two bosses, the edge of the rim curved inwards. The surface is coated with slip of reddish brown colour, the painted ornamentation is done in dark brown, and on the inner side there are lines of a similar colour. The incurving section of the rim between the rim-bosses is painted in the same colour as the ornamental lines. Provenance, in the department of La Candelaria, unknown. (G. M. 33. 15. 695).

— *e*. Small rim fragment, from El Quebrachal. Slip-coating of dark red colour, with ornamental lines in black. (G. M. 33. 15. 381).

— *f*. This fragment is coated with slip of the same colour as that found on the large fragment, fig. 116, *a*, a colour also seen in the ornamental lines. A few faint traces of orna-

mentation done in a similar colour occur on the other side of the fragment. Provenance, Unquillo. (G. M. 33. 15. 632).

— *g*. Fragment of a vessel which seems to have been unsuccessfully fired, which would account for its being of a di-

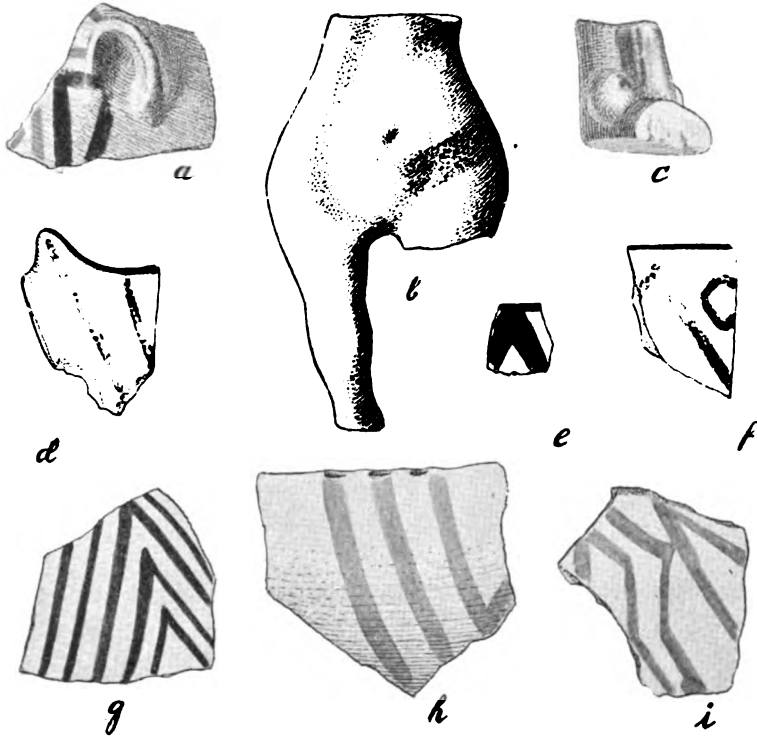


Fig. 119. Fragments of brick-like ware with painted ornamentation from various sites in La Candelaria. Scale 1/2.

vergent colour. The ornamental lines are brownish black, while the slip-coating is of a greyish tint. Provenance, Cuchiyaco. (G. M. 33. 15. 299).

— *h*. Rim fragment. On both inner and outer sides the ground is light-brown, and the ornamented lines in a darker shade of brown. Three dots are impressed in the edge of the rim. Provenance, El Molino. (G. M. 33. 15. 696).

— *i*. The slip-coating is of light-brown colour on both inner and outer sides. On the outer side the ornamental lines are painted in dark brown, while those on the inner side are darker still. The exact locality in La Candelaria where it was discovered is not known. (G. M. 33. 15. 379).

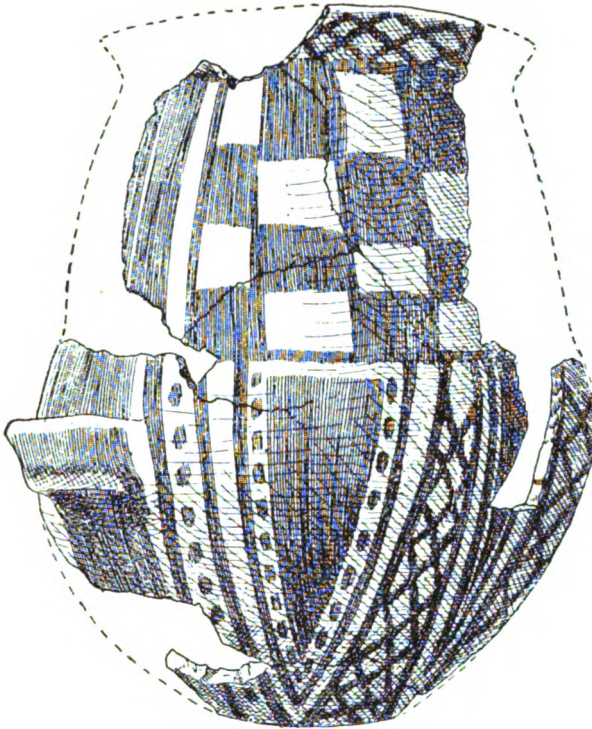


Fig. 120. Sepulchral urn from Sta. Barbara, La Candelaria. (U. M. o. T.)

IV.

Burial urn of Diaguitan origin.

In the foregoing attention has been drawn to various points of resemblance between the archaeological finds here discussed and finds from the Diaguita district. Only one vessel of purely Diaguitan type is known to me from La Candelaria, viz. the one here illustrated in fig. 120, which represents a child's sepulchral urn of so-called Andahuala type BOMAN (I, fig. 6, e). This urn is preserved in the Tucuman University Museum collections, and was excavated by Dr. Métraux in a stream gully at Santa Barbara. No

other archaeological objects whatever were found in association with it. Its height is 32 cm. At the excavations carried out by AMBROSETTI (4) in Pampa Grande were discovered not only sepulchral urns corresponding with those of La Candelaria, but also urns of Diaguita type, for the most part consisting of children's sepulchral urns of Santa Maria type. The latter category of finds of Diaguitan character are very numerous, while in La Candelaria they are only represented by the vessel just referred to. Pampa Grande is however situated considerably nearer to the Calchaqui valley than is La Candelaria. Already in this connection it may be mentioned that in Pampa Grande the Diaguitan finds were discovered at a higher level than the finds of La Candelarian character, that is to say that in the locality in question the Diaguitan finds belonged to a later period, a point to which I shall recur below.

V.

Objects of stone.

Grinding stones and mortars.

From descriptions given in the foregoing we have seen that among the Indians of ancient La Candelaria the custom prevailed of burying their dead directly in urns within the dwelling site itself. Even if not all the pottery fragments that have been collected from the ground surface within the same area as the sepulchral urns in themselves indicate that the site of the burial was identical with the dwelling site, one only needs to examine the stone objects of any given area to be convinced that the burial site coincided with the dwelling site. This because the greater part of the finds collected consisted of stone mortars, stone pestles, grinding stones, whetstones, stone celts, sling-stones, etc. The character of these finds supply clear evidence that the locality concerned must have been under occupation for some considerable space of time. Even if subsequently a sepulchral urn has now and then been discovered unassociated with superficial finds of the categories just mentioned, the number of urns discovered under such conditions is so insignificant that they cannot provide ground for calling in question the assertion that, among the Indians that maintained the culture represented by the archaeological finds we are here concerned with, the custom of direct urn-burial within the dwelling site prevailed.

When in La Candelaria mestizos of our days grind maize, they may on occasions be seen using a grinding apparatus of stone. This consists of a large-sized block, the grinding

stone, with a practically plane face against which the grinding is done, and a smaller stone. The latter, which has one or more plane faces, is held in both hands. This smaller stone, to which I shall here refer as the muller, is by the grinder moved backwards and forwards. These modern grinding apparatuses so closely resemble those found in ancient Indian sites that, if a modern one were deposited on such a site, no archaeologist who was unaware of that fact would be able to tell it from its ancient counterparts. Stone mortars, on the other hand, I never saw in use in La Candelaria, in spite of the fact that they are supposed to possess an advantage over wooden mortars of modern use in that the maize, while being pounded with the pestle, is not so apt to skip out of the hollow part. The grinding stones described above are popularly known as "conanas". — A detail irrefutably proving that maize was actually known to the Indians of ancient La Candelaria is found in the striated marks that especially occur on the outer side of the large, bowl-shaped vessels that serve as lids for sepulchral urns. Now and then striated marks are also seen on the outer sides of the urns, and also, although more seldom, on their inner sides. The fact of grinding stones and stone mortars having been found in large numbers tells us that cultivation of maize was of fundamental importance in the domestic economy of those Indians. Early writers on the Indians that lived in the neighbourhood of Tucuman accordingly mention maize among the principal foodstuffs of the Indian population (NARVAEZ, p. 144). That arrow-heads of stone are so sparsely represented among archaeological finds goes to indicate that hunting was of inferior importance. Maize-grinding apparatus of stone, archaeologically discovered in northwestern Argentina, has by DEBENEDETTI (3, p. 137 and foll.) been divided into four different groups:

Type 1. Stones of varying sizes with a conical or cylindrical depression of varying depth into which is placed the grain that is to be ground. The grinding is achieved by



Fig. 121. Stone mortar from Agua Chica, La Candelaria.

repeatedly pounding it with a cylindrical stone pestle. This type still survives in the Andine valleys of Argentina, but is more and more being supplanted by wooden mortars. This type constitutes a mortar rather than a grinding apparatus, even though it serves the same purpose.

Type 2. This is characterized by the depression being elongated and shallow. The grinding is performed by the help of a small stone which, held in both hands, is rubbed backwards and forwards along the depression.

Type 3. This group comprises grinding implements consisting of two flat stones rubbed against each other, with the grain placed between them. This type also still occurs in our time and is known as "pecanas".

Type 4. This type consists of two stones, one of which is flat while the other has a strongly convex surface, and it is the latter that does the essential part of the grinding. It is put into a rocking motion, and by its weight is made to crush the maize placed between it and the flat stone which serves as an underlay. This type is still in existence, especially in the border region between Argentina and Bolivia, where it is called "conana". Like the foregoing, it also occurs in the province of San Juan.

Types 1, 2 and 3 are represented among La Candelarian finds. Stone mortars (type 1) occur in La Candelaria hollowed

out in the solid rock — the only known example of this being "Los Morteritos", at Santa Barbara, a find here already dealt with (p. 70 and foll.) — and also consist of small and detached blocks of stone that have been hollowed out. In the latter case the hollow is always bowl-shaped. A stone mortar of this type, from Agua Chica, is illustrated in fig. 121. The maximum length of the block is 35 cm. At Quebrada de la Virgen there was, as already mentioned, a large block of stone with a flat upper surface, in the middle of which a shallow, circular depression (fig. 20) had been sunk by pounding. The depth of the depression being slight, this cannot very well have constituted a mortar of any practical use, although possibly the beginning of one which was never finished.

It is often difficult to draw a definite line of demarcation between stone mortars and such grinding stones as come under Debenedetti's type 2 above. This group is characterized by the oval depression. A number of grinding stones of that type from Unquillo are seen in fig. 74. This type and the one here next following are those which are most common in La Candelaria. It may, however, happen that the depression is very nearly round, and in such cases the object in question cannot easily be determined either as a mortar or a grinding stone.

There is lastly the third type which comprises grinding stones with a more or less plane face. This flat surface is occasionally somewhat raised in the middle, or occasionally slightly sunk. Of the former, examples are seen in the foremost grinding stones in fig. 9, and of the latter in fig. 19, *a-b*. The difference — as regards employment — between these grinding stones and those with an oval depression is that in the case of the former the maize runs off on its own accord as it is being turned into meal, while with hollowed grinding stones it is necessary to scoop up the ground maize with the hand, unless the stone be set at a sloping angle. The latter alternative does not, however, appear to have been

resorted to, seeing that the hollows are symmetrical and therefore must have been produced by even and uniform wearing down. The rock of which the grinding stones from Quebrada de la Virgen (fig. 19, *a-b*) consist is of a conglomerate character, and the hardest particles of the rock project out of the plane surface, a circumstance very likely of advantage in the grinding.

References to grinding stones and stone mortars are of rare occurrence in South American ethnographical and archaeological literature. I am of opinion that these implements, the grinding apparatus in particular, were connected with maize cultivation, and it is therefore interesting to find that the majority of authenticated instances of their occurrence are just from northwestern Argentina, a region where the cultivation of maize was of fundamental importance in Indian domestic economy. Maize-grinding apparatus consisting of a flat stone and a muller is mentioned by GARCILASSO DE LA VEGA (vol. II, pp. 355—356) from the Inca Indians, but this apparatus is typical not only of the western Andine highland but also occurs in eastern Paraguay (SCHMIDT, 3, pl. XII), and in eastern Brazil (NETTO, pp. 508—509). As regards stone mortars it is possible as was pointed out in the foregoing, to replace them with wooden ones, and since the latter material could not have been preserved through the ages it is difficult to ascertain whether this implement was formerly used among maize-growing peoples in tropical regions.

With the stone mortars a pestle of stone was used, and a muller (of stone) was necessary for the grinding stones. Two stone pestles are depicted in fig. 122, *a-b*. Pestle *a* is oval in section and consists of greyish blue rock of fine grain. Its broader end was essentially used for percussion, the opposite one showing but faint traces of such wear. Judging by the appearance of the side surfaces, the pestle was given its desired shape by pounding. The other pestle has a circular cross-section. One of its ends is broken off. It is made from

a rock similar to that in the foregoing, but no traces of pounding are observable on the sides of the pestle. At Unquillo, too, a pestle with round section has been found. Both its ends are broken off, but it can nevertheless be seen that one end was thicker than the other. In fig. 122, *c*, is lastly to be seen the muller of a grinding stone for maize. Mullers

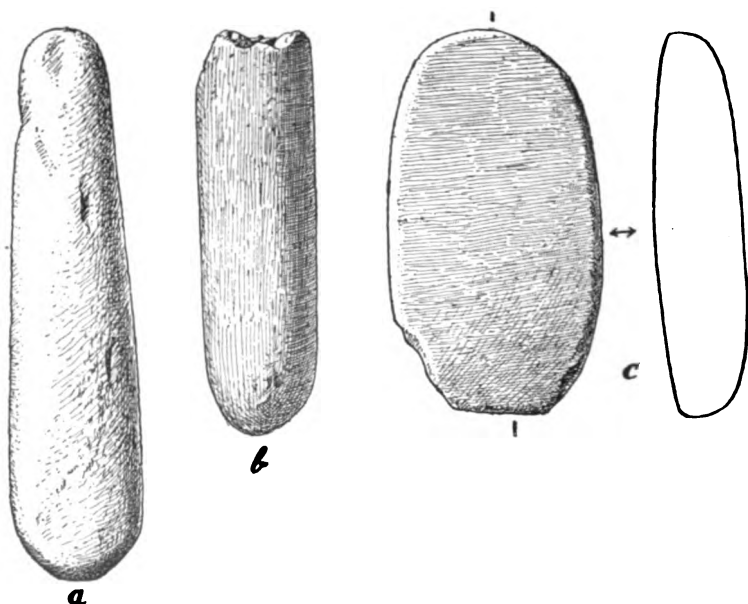



Fig. 122. a. stone pestle from Huanacocha, La Candelaria, b. stone pestle from Huanacocha, La Candelaria, c. muller pertaining to apparatus for grinding maize. Agua Chica, La Candelaria. Scale about $\frac{1}{4}$. (G.M. 33.15.547, 713, 592).

of this type are frequently collected in the ancient dwelling sites. The one here depicted is made of fine-grained rock and the side of it that in the picture is turned into view has by constant wear become almost flat, only the middle part of it being higher than the edges. On the opposite side no traces of wear can be seen, while in another muller (G. M. 33.15.591) that side presents no less than two surfaces that

have been worn flat, so that this particular stone possesses three wearing faces, one large and two smaller.

At Quebrada de la Virgen there were also found a number of stones on which plane surfaces have been produced by wear. They are illustrated in fig. 19, *c, g, h*. These stones are in all certainty not grinding stones but whetstones. The rock of which they are made consists, so far as I can remember, of sandstone, as opposed to the grinding stones, which were always made of some harder kind of rock. A few other whetstones, of smaller size, are depicted below, and it may be supposed that all of these whetstones were used in the manufacture of stone axes, and for putting a new edge to these implements.

Stone celts.

There are two ways of hafting stone celts. The axe may either be fitted with a straight handle or an elbow haft, that is to say, one bent like this: . To one leg of the angle the blade is fixed, while the other is grasped by the hand. Celts of the latter type are known as elbow-hafted.

Elbow-hafted celts are in their turn divided into two groups, viz. axes and adzes, the cutting edge in the former being set lengthwise with the handle, and in the latter at right angles to it (as in a hoe). As regards the elbow-hafted celt, in Oceania the invention has been made of fitting the blade into a twistable holder, which enables the tool to be used both as an axe and an adze PARKINSON (p. 147). A similar invention has been made by the Babuende tribe, of the Congo. Here, in a straight handle, the iron blade is fitted into a cruciform socket, and thus usable both as an axe and an adze (NORDENSKIÖLD, 5, p. 166, fig. 6; LINNÉ, 1, p. 198). By this, a great advantage has been gained. The elbow-hafted adze is especially suitable when an object has to be hollowed out, as, e. g., a canoe, while the axe is to be preferred when, e. g., a tree is to be felled. Thanks to the movability of the blade, the same tool can be used for

both purposes. The felling of a tree with an adze would constitute an exceedingly difficult piece of work. From this it may be inferred that a people possessing elbow-hafted adzes with fixed blades also may be expected to possess straight-hafted axes.

In South America the elbow-hafted axe is entirely absent. In Mexico, on the other hand, it seems to have existed. SAVILLE (pl. II, a, c) has studied ancient Mexican Indian wood-carving, partly from illustrations found in Mexican manuscripts. The two figures just mentioned evidently represent elbow-hafted axes, the blades of which are of metal, as may be judged from their outward-curving edges. The blade is lashed on to the side of the haft. It may, perhaps, be objected that this pictorial representation may be due to faulty perspective on the part of the artist, and that the pictures are instead meant to represent adzes. One of the pictures, however, shows a man engaged in felling a tree. Owing to the shape of the handle, work of that kind could not very well be done by means of an elbow-hafted adze.

In elbow-hafted stone adzes the edge is of a typical shape, nota bene if the blade was fixed, and the tool had seen a great deal of use. For it may be mentioned that in such a tool the edge is not found in the median line of the blade but nearer to one side (cf. the blades in fig. 123, *d* and *f*). Other details as to the form of the stone celt also indicate whether its handle was straight or of elbow shape. In northwestern Argentina, stone celts were generally provided with a groove for facilitating the fastening of the blade to the haft. Where this groove occurs on the two broader sides of the blade, as well as on one of its narrower sides, as the case is, e. g., with the celt seen in fig. 125, *m*, the blade was fixed in a straight handle. If, on the other hand, the groove occurs on one of the broader, and two of the narrower, sides of the blade, in the way seen in fig. 123, *g*, then the latter had an elbow haft, into which it was set at right angles, that is to say it was used as an adze.

From stone celts that have been collected in the various archaeological sites in La Candelaria it is evident that there were anciently used both elbow-hafted adzes and straight-handled axes. The latter were however most numerous.

In fig. 123 are depicted a number of stone celts that were elbow-hafted.

Fig. 123, *a*, shows a stone celt from Huanacocha, (G. M. 33. 15. 543) together with a diagram of its longitudinal section. It was found on the ground surface above a sepulchral urn at the site mentioned (p. 102). As is apparent from the sectional diagram, the edge is asymmetrically placed. The blade is of almost rectangular section, and its length is 11 cm. It is 2.5 cm. thick. The rock of which it is made is of bluish grey colour, and fine-grained, with mica particles visible to the naked eye. The sides of the celt show no trace of having been polished, and are more or less rough. The edge is obtuse, and the axe-head appears to have been given a well adapted shape from the start, so that it would only have been needed to sharpen up the cutting edge. A stone implement of exactly similar shape is found in a collection belonging to the Gothenburg Museum from the Mosquito coast, in Central America (G. M. 31. 7. 13). If this latter stone object had been found in some archaeological site it would unhesitatingly have been classified as a stone axe. But on the occasion when it was acquired, the Indians used it for scaling tarpon, but whether this was its original purpose, or whether it is a case of an ancient stone axe in this way secondarily employed, is a question I must leave open. It furnishes, however, a case in point illustrating the need of proceeding with a certain measure of caution when it comes to determining the use to which a given archaeological stone implement was formerly put.

— *b*, illustrates a stone celt made of some brownish, fine-grained and stratified kind of rock, whose line of cleavage coincides with the line of the cutting edge of the celt. Its

section is a pointed oval, its length 9 cm., and its provenance Cuchiyaco. Only the edge — and the region next to it — is ground, the edge accordingly still possesses a certain degree of sharpness. As will appear from the figure, the axe is very crudely shaped, and marks from the chipping are everywhere visible, especially along its narrow sides, which in the upper part are slightly incurving as a help in fastening. The butt is round. (G. M. 33. 15. 303).

— *c*. A large axe-head of almost triangular section is illustrated in fig. 123, *c*. It is made of fine-grained, blue-grey rock. Its surfaces are only ground in parts, care only having been bestowed on the region of the edge, while the butt part is left practically unworked. Next to the butt the narrow sides are slightly curving inwards, as is apparent from the figure. The cutting edge is thickly blunt, and the axe appears to have been modelled in a suitable form so that there only remained the sharpening of the edge and the making of a groove close to the butt for the haft-fastening. Its length is 12.5 cm., and its provenance is Huanacocha. (G. M. 33. 15. 546).

— *d*. The axe-head seen in fig. 123, *d*, is made of a fine-grained, brownish kind of rock. It originates from Toro Loco, and its length is 9.5 cm. The butt is imperfectly polished, while more work has been expended on the cutting edge which, as seen from the sectional diagram, is asymmetrically located. Up at the butt the two narrower sides are slightly recessed in order to facilitate the lashing of the head to the haft. To the same end the two recesses are united by means of a shallow groove which runs across one of the broader sides of the blade. (G. M. 33. 15. 326).

— *e*. The axe-head illustrated in fig. 123, *e*, is made of grey-blue, fine-grained rock. Its length is 17 cm., and its provenance is Estanzuela. The cutting edge and the part next to it have been given more careful polishing than the butt portion, where the surfaces are rougher. The edge is somewhat asymmetrically located. Both of the narrower sides

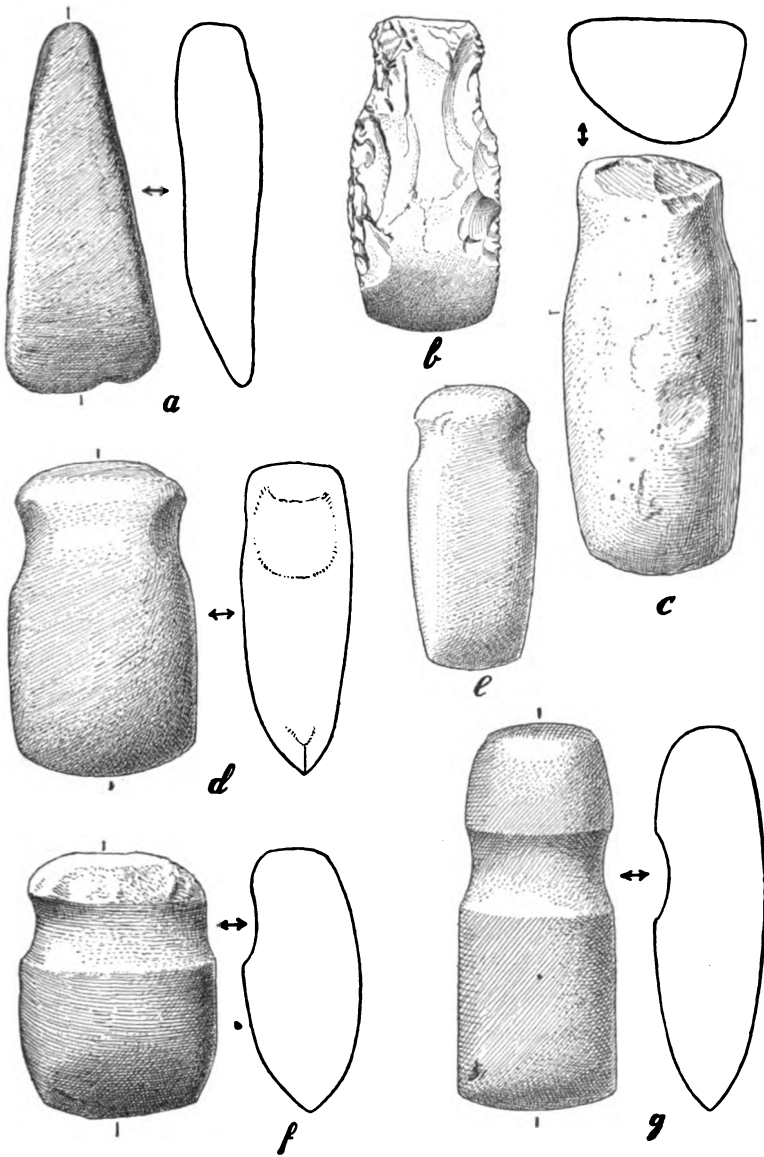


Fig. 123. Adze-blades from various archaeological sites in La Candelaria.

are slightly recessed near the butt, as seen in the figure. (G. M. 33. 15. 712).

— *f*, shows an axe-head of brownish grey, finegrained rock. The edge and the groove just below the butt have been polished more carefully than the butt itself. As will be seen from the longitudinal section, no groove has been made in one of the broader sides. It is 7.5 cm. long. Provenance, El Molino. (G. M. 33. 15. 400).

— *g*. A carefully worked and finished stone celt is seen in fig. 123, *g* (G. M. 33. 15. 569). It is made of brown-coloured, fine-grained rock. Nearly all of its surface has been ground and polished with equal care. From the longitudinal section it will be seen that one of the broader sides lacks the groove for fastening, thus indicating that this celt was used with an elbow-haft, i. e. as an adze. It was found at Caspinchango. Its length is 11.5 cm. A celt in which the butt is of a somewhat rounder shape, although otherwise exactly similar to the one here depicted, was by Professor ERLAND NORDENSKIÖLD recovered at Iguembe, in Bolivia (R. M. I. 8). Iguembe is situated northeast of Tarija, and between the rivers of Pilcomayo and Parapiti.

LINNE (I, p. 197 and foll.) has studied the distribution of the elbow-hafted celt in South America and shown that it occurs principally in the western part of the continent. Further authenticated instances might no doubt be added to Linne's map of distribution, but would, however, in no way modify the picture presented by the map but only confirm the distribution of this type of celt as it has already been established.

Stone celts provided with a groove for hafting occur mainly in northwestern Argentina, and in eastern Bolivia, where they follow the slopes of the Andes, they extend as far north as Sta. Cruz de la Sierra (NORDENSKIÖLD, 14, map 2, p. 143). As regards the evolution of the T-shaped axe it is stated by RIVET and VERNEAU (p. 155): «La hache à oreilles semble être un type essentiellement sud-amé-

ricain, dont l'origine doit être cherchée, croyons-nous, chez les peuplades de l'est et du nord-est de ce continent, son introduction sur les hauts plateaux n'étant que secondaire. Dans cette région, aux mains de populations plus civilisées, l'outil évolua rapidement vers des formes plus pratique et plus maniables, et nous verrons que c'est là enfin que l'instrument de pierre fut remplacé par l'instrument de cuivre.» This theory is also supported by NORDENSKIÖLD (14, p. 141). LOVÉN (p. 135 and foll.) has also studied the T-shaped axe in the West Indies archaeologically and established its sporadic occurrence in Guiana and the Amazonas region. It may be mentioned that in NIMUENDAJÚ's collection, referred to below, a few specimens of the T-shaped axe from the latter area discovered singly are preserved, and axes of this type also occur in the coastal districts of the state of Maranhão (LOPES, p. 619 and foll.). LOVÉN (p. 204) is however of opinion that the T-shaped axe has its centre of distribution in the Andine highland. This no doubt in particular applies to the type with long, well-marked arms and straight sides, i. e. the type most nearly represented in La Candelaria by the axe seen in fig. 125, o. This type of metal axe is held by NORDENSKIÖLD (14, p. 59) to be a pre-Incan form which has spread from the southern parts of the region that was under Incan dominion. Subsequently the type has been copied in stone outside the distribution area of the metal axes. The further question as to the locality where the T-shaped axe had its cradle falls outside the scope of this paper. The celt provided with marginal notches for hafting is by RIVET and VERNEAU (p. 149) set down as a specific Amazonas type, an opinion which has subsequently been confirmed through finds of stone celts of this type included in the archaeological collections from the Amazonas region, mainly from the Santarem district, that have been added to the Gothenburg Museum by the German-Brazilian explorer, CURT NIMUENDAJÚ.

Both the T-shape, the hafting-groove and the marginal notch have been invented for the better hafting of the celt. Hitherto these devices have only been taken into consideration so far as they occur in axes. They are, however, also found on celts used as adzes, that is to say, of the elbow-hafted category. Of La Candelarian adze-heads, all, as we have seen — with the exception of a single one, fig. 123, *a* — are provided with an encircling groove. The circle may in cases be incomplete, as, e. g., seen from the adze-heads in fig. 123, *b, d, e*, where it only occurs as a marginal recess, thereby typologically approaching the T-shaped axes. The adzes just referred to are not, however, classable with those from the Mizque valley that are depicted in fig. 124, *b* and *c*. They are, it is true, provided with marginal notches for facilitating hafting, but these notches have in the La Candelarian finds been produced by pounding, while in the adzes illustrated in fig. 124, *b-c*, they have been ground up by means of a whetstone, or by drawing a string backwards or forwards until a fine groove has been worn into the material.

In La Candelaria, stone axes and stone adzes have been superficially discovered at one and the same archaeological dwelling site. They must therefore have been locally contemporaneous. All La Candelarian stone axes are provided with a groove for hafting, with a single exception (fig. 125, *o*) which is T-shaped. The plain, neolithic celt, which is devoid of any preparation whatever for hafting, is entirely absent in La Candelaria. It is therefore not impossible that the grooveless adze, fig. 123, *a*, owes its shape to nothing but nature. The encircling, or partly encircling, groove that in the adze supplies support for the fastening of the haft, recurs on the axe-head either in the form of a groove in one of the broader sides, as well as in both margins, of the blade, or else only as notches in both margins. In the axe, the groove provides support for the haft itself, while in the adze it merely constitutes an improved support for the ligament.

In Bolivia, too, the adze and the axe, grooved for hafting, occur in association with each other. I have already mentioned an adze-head from Iguembe, from which region two more adzes, resembling the one seen in fig. 123, *g*, are also known, one originating from Itatembia (G. M. 15. 2. 84), and the other from Yataveri (R. M. I. 28). In fig. 124 are further depicted some adze-heads from the Mizque valley, one of which, fig. 124, *d*, is grooved for hafting. Grooved adze-heads do not constitute the only finds of this class known from that district. The plain, neolithic celt is also represented among the adzes. One of the latter is depicted in fig. 124, *a*. In fig. 124, *b* and *c*, are seen adze-heads with marginal notches: and lastly, the celt depicted in fig. 124, *e*, represents the T-shape adapted to an adze-head. The marginally notched axe, as we have seen, was typical of the Amazonas region, and a similarly notched adze is known from Rio Tapajos (KATZER, p. 37). From NORDENSKIÖLD's map (14, map 2, p. 143) of the distribution of the different celt types in eastern Bolivia it will be seen that also the axe-head with notches for hafting occurs in the section of Bolivia that is drained by affluents to the Amazon river. In the Mizque valley stone adzes it is therefore possible to discern influences received from three different quarters. The T-shape has come from the north, the Amazon basin or the west, the high plateau; the notches for hafting, from the north, i. e. the Amazon basin; and the encircling groove from the south, i. e. northwestern Argentina. In addition there occurs in the Mizque valley also the plain, neolithic adze. Chronological relations between these different types are, however, difficult to determine. The plain neolithic celt dates farthest back, but how the remaining types of celts are chronologically interrelated cannot, at the present stage of our knowledge, be determined. Unfortunately the Mizque valley material was never finally published by Erland Nordenskiöld. HUMBLA (pp. 331—332) who has published these Nordenskiöld's finds of adzes from

the Mizque Valley, states that all of them were discovered in association with engraved pottery of the type that is considered older than the Tiahuanaco-influenced ceramics.

Supplementary to the illustration in fig. 124 of the finds from the Mizque Valley the following information may be given.

— *a*. Dwelling-site find. Pulquina, La Franca. Made of dark, greyish green, fine-grained rock. Especial care given to the polish of the cutting edge portion. Length, 7 cm. (G. M. 15.2.21).

— *b*. From Holquin. Made of dark-brown, fine-grained rock. Carefully polished all over. Flat butt. Length, 7 cm. (G. M. 15.2.20).

— *c*. Dwelling-site find. Pulquina, La Franca. Made of blue-black, fine-grained rock. The adze is carefully polished, although the raw surface of the rock is visible in a few depressions. The cutting edge is damaged. Length, 5 cm. (G. M. 15.2.21).

— *d*. Dwelling-site find. Pulquina, La Franca. Made of fine-grained, greyish-green rock. Butt — very nearly flat, and less carefully polished than the rest of the adze. The cutting edge is somewhat blunted. Length, 5.5 cm. (G. M. 15.2.21).

— *e*. Find from Chilon. Made of dark-green, fine-grained rock. Finely polished, but exhibiting certain defects in the form of chipped spots both in the cutting edge and the butt. In the incurving margins traces of pounding can be seen. Length, 9 cm. (G. M. 15.2.16).

It should also be pointed out that the axe-head provided with a hafting groove very frequently occurs in the Diaguita district, while similarly worked adzes, on the other hand, appear to be more rarely found. With regard to the latter, I only know of a single specimen (G. M. 30.29.39). It resembles that seen in fig. 123, *f*, although it is of a more elongated shape, and originates from Fuerte Quemado.

In fig. 125 are depicted a series of celts from La Candelaria, of which *a* and *b*, judging from faint traces of marginal notches, were elbow-hafted, while the remainder were straight-handled.

— *a*. Made of some brownish kind of rock, fine-grained and stratified. The lines of cleavage coincide with the cutting edge, which constitutes the best polished portion of the blade. The section is rectangular, almost square, although with rounded corners. Marginal notches only faintly visible. Length, 8 cm. Provenance, Alto Alegre. (G. M. 33.15.660).

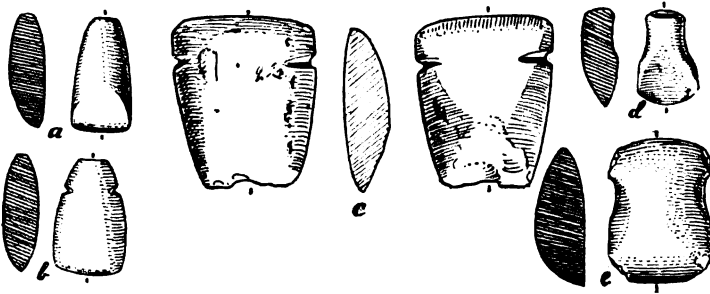


Fig. 124. Adze-blades from the Mizque-valley, Bolivia.

— *b*. Rock material similar to that in the foregoing. Here, too, the line of the cutting edge coincides with the line of cleavage. Care in polishing has only been expended on the edge, the rest of the celt being only roughly polished. The marginal notches show traces of wear from the haft. Section very nearly rectangular. Length, 8 cm. Provenance, Unquillo. (G. M. 33.15.489).

— *c*. Celt made of bluish-grey, fine-grained rock. Rather roughly fashioned and almost devoid of polish. In this case it would seem as if a piece of stone, already possessing the required shape, had been pressed into service, at which merely a rough trimming of the surfaces was deemed necessary. The cutting edge is badly damaged, and in the centre of each of the broader sides a small pit has been sunk by pounding. The section is very nearly rectangular, with the

shorter sides rounded. Length, 15 cm. Provenance, Sta. Lucia. (G. M. 33.15.520).

— *d.* Celt made of fine-grained rock of grey-black colour. The blade is of very rude workmanship, which appears to have been limited to sharpening up a cutting edge, and the production of a hafting-groove by pounding, after which operations it would have been considered fit for use. The section is very nearly triangular. The edge is much damaged. Provenance, Sta. Barbara. (G. M. 33.15.342).

— *e.* Celt, of fine-grained, grey-brown rock. The surfaces are smooth, but probably this smoothness is due to nature, so that only the region about the cutting edge has been smoothground. The groove for hafting that runs round the blade has been produced by pounding. The butt is damaged on the side that in the figure is turned away from view. Length, 12 cm. Provenance, Sta. Isabel. (G. M. 33.15.533).

— *f.* Fragment of a celt made of fine-grained, blue-grey rock. The section is oval, and, in the place of a hafting-groove, it is provided with two parallel ridges which, however, in the side that was against the handle are replaced by a depression. Length, 7 cm. Provenance, Agua Chica. (G. M. 33.15.590). A similar shape of hafting-grooves occurs in a fragmentary axe-head from La Candelaria, which has been published by SCHREITER (1, fig. 14:7). In addition, its butt-end has the shape of a human or animal head. A hafting-groove with ridges is also found in an axe from Rosario de la Frontera, in the province of Salta (AMBROSETTI, 2, vol. XX, fig. 152). In the neighbourhood of Rosario de la Frontera sepulchral urns similar to those here dealt with from La Candelaria (p. 271) have also been found.

— *g.* Celt, of grey-brown rock. The butt, unlike the edge region, very incompletely polished. On the blade are two grooves for hafting puposes. The groove that is nearer the cutting edge is more worn than the one nearer the butt. In the latter can still be seen distinct marks from pounding. The section is very nearly oval, the side without the groove

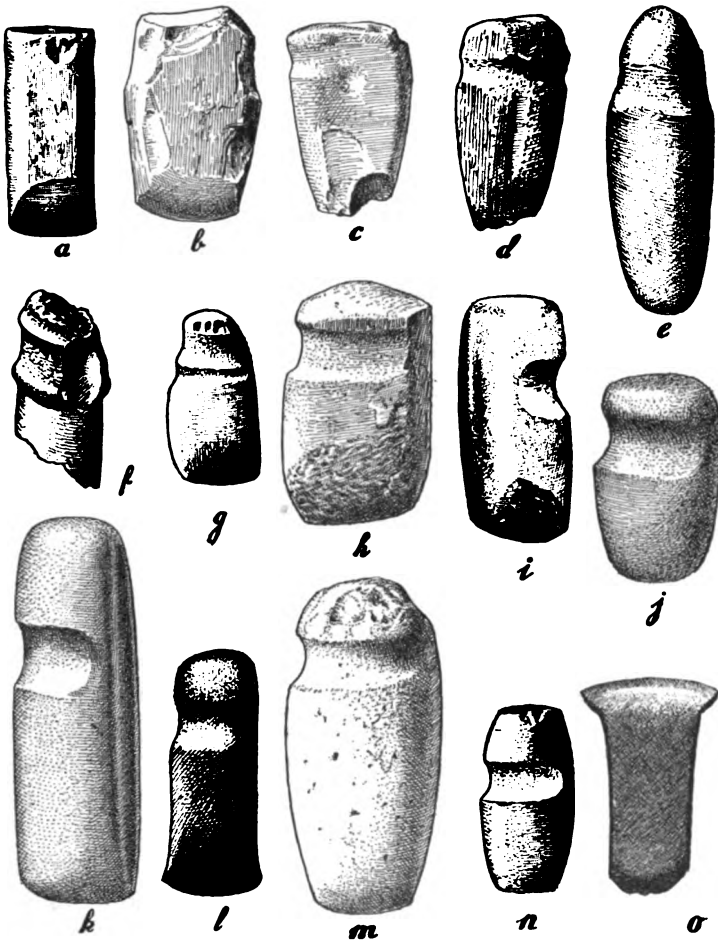


Fig. 125. Stone axes from various archaeological sites in La Candelaria.

being, however, somewhat flatter than the other. Length, 14 cm., width, 7 cm. Provenance, Unquillo. (G. M. 33.15. 484).

— *h*. Large blade of fine-grained, grey-brown rock. Weight, 3.8 kg. Length, 18 cm., width 10 cm. The edge is obtuse, while the surface is rugged and only incompletely

polished. The side of the blade that probably faced the haft, and which lacks a groove, is flat, while the other side is rounded. Provenance, Unquillo. (G. M. 33.15.483).

— *i*. Fragment of celt, in which the cutting edge is missing. Section nearly oval. Of the narrower sides, the one that lacks a hafting-groove has been slightly smoothed. Judging by the rough marks left in it, the groove appears to have been pounded out. Length, 9.5 cm. Provenance, Cuchiyaco. (G. M. 33.15.302).

— *j*. Celt of fine-grained, brown rock. Oval section. The butt is ground flat, and the blade on the whole ground to a fine polish. Both of the broader and one of the narrow sides are grooved for hafting. The groove still shows marks from pounding. Length, 8 cm. Provenance, El Tala. (G. M. 33.15.658).

— *k*. Of the La Candelarian celts, this find presents the best workmanship. Its material consists of bluish grey, fine-grained rock, and its surfaces are given a beautiful polish, only the butt being somewhat rugged. The cutting edge is worn somewhat blunt. In section, the celt is oval, and its two broader sides, as well as one of the narrow ones, are provided with a carefully finished groove for shafting. The side that lacks this groove has in its place a shallow channel running lengthwise with the blade. Length, 13 cm. Provenance, Sta. Barbara. (G. M. 33.15.343).

— *l*. A well polished celt of fine-grained, blue-grey rock, in which marks from the pounding by which the blade has been formed only are visible on the butt and in the hafting-groove. The cutting edge, as seen from the figure, curves out from the rest of the blade, and the two broader sides, as well as one of the narrow ones, are grooved for hafting. The ungrooved side, which rested against the haft, is ground slightly flatter. Length, 9.5 cm. Provenance, Sta. Barbara. (G. M. 33.15.344).

— *m*. A very large celt, measuring 27 cm. in length, and 9 cm. in thickness. It weighs 4.7 kg. The cutting edge,

which still retains a certain degree of sharpness, is the best polished part of the blade, while the butt presents no traces of grinding. It is made of grey-coloured, fine-grained rock. Its cross-section is oval, and the two broader, and one of the narrower, sides are grooved for hafting. Provenance, Unquillo (G. M. 33.15.482). — A second celt from the same locality, similar to the one here described but one-third larger, was unfortunately lost in the fire that ruined part of my collection in transport.

— *n*. Celt, of fine-grained, blue-grey rock. Edge region more carefully polished than that of the butt. It is of oval section, and the narrow side that lacks hafting groove is instead provided with a shallow and narrow depression running lengthwise to the blade. Length, 15 cm. Provenance, El Tala. (G. M. 33.15.657).

— *o*. T-shaped stone celt. This is the only specimen of its type known from La Candelaria. I myself have never had an opportunity of seeing this axe, and only know it from a drawing placed at my disposal by Professor A. MÉTRAUX. Length, about 10 cm.

The celt grooved for hafting constituted the predominant type in ancient La Candelaria. Its handle was double, that is to say it consisted of a pliant bough bent together in the middle, and in the bend the blade was firmly wedged. The groove in the blade contributed to the rigidity of the fastening.

In the case of the celts depicted in fig. 125, *a* and *b*, the material differs to some extent from that of the rest. The two celts in question consist, as already mentioned, of rock that is stratified. When rock of this character is used as raw material for celts, it is almost always found that the cutting edge coincides with the cleavage lines of the rock, just as in the present case. This probably tends to enhanced sharpness of the edge, as well as to making it more durable. It also makes for facilitating the process of manufacture, seeing that the broader sides of the blade will be formed by the natural and smooth cleavage planes of the rock.

The small pits seen in the two broader sides of blade *c* have probably come into being by the blade having been secondarily employed as an underlay for crushing chañar kernels. KRAUSE (figs. 101, 102) depicts two stone celts from the Karaja Indians, in which similar pits are distinctly visible. At the same time he depicts a pounding stone and a pitted stone underlay as an appliance used for cracking palm-nuts, and mentions that archaeological stone axes are frequently made use of for the latter purpose. The pits in this La Candelarian stone celt suggest its having been put to some secondary use of a similar character. For my own part I have seen Ashluslay Indians, engaged in eating chañar kernels, place the kernel in a small depression hollowed out in a thick bough of some hard wood in order to keep it steady while they broke it up by means of a pestle, or the like. The pits seen in the La Candelarian celt may conceivably have served a similar purpose.

The celts, *d* and *e*, appear to be only half finished.

The T-shaped celt, fig. 125, *o*, points to connections with the highland region. NORDENSKIÖLD (14, p. 141) has pointed out that this stone implement has a wider distribution than its metal counterpart, and that this fact may be explained in two ways: either the stone celt is of more ancient origin than the metal celt, or the latter has been imitated in stone beyond the limits of the area of distribution of the metal celt. That stone axes were made on the model of metal axes of this type would in such a case have been owing to certain advantages possessed by the metal type over the other types. Its having spread to regions where other types, in stone, were prevalent speaks in favour of this supposition. In this connection I may mention that a T-shaped stone celt resembling the one here depicted — a type which is especially abundantly represented in archaeological sites on the eastern slopes of the Bolivian Andes — was acquired by me at a Mataco village near the present railway station of Ingeniero Juarez, on the line Formosa-Embarcacion. By

means of intertribal trading among the Indians it had found its way even into the heart of the stoneless Chaco.

The majority of these straight-handled stone axes have the appearance of having been designed for working purposes, and not for use as war weapons. Among the latter may perhaps be counted the very beautiful specimen seen in fig. 125, *k*. Probably stone axes were used in cutting away charred portions of the trunks of trees that were felled for hut-building or in order to clear forest land for maize cultivations. Especially worthy of note are the large stone axes that have been referred to above. The occurrence of similar giant axes up in the salt desert of Puna de Jujuy has by NORDENSKIÖLD (15) been connected with the mining of salt in those parts. This explanation cannot be applied to the large stone axes of La Candelaria because here we have no salt deposits like those of Puna de Jujuy. On one occasion I observed, in La Candelaria, a mestizo using as fuel a slaty kind of rock of high oil percentage. It is possible that the ancient Indians used this rock for the same purpose, and that they then used the big axes for breaking it up. This explanation is however here offered with the greatest possible reserve. It is in this connection a noteworthy circumstance that in these axes one more frequently finds the butt damaged than the edge. This should especially be emphasized in view of the fact that this defect occurs in certain stone celts other than those which are here published. Possibly this may in certain cases be accounted for by the blade having been very roughly hewn into shape prior to its being ground, and that this operation was limited to the region comprising the cutting edge.

Celts of adze type may possibly have been used as hoes. That the hoe was in the highlands used in agriculture has been mentioned by STEFFEN (p. 79—80). He describes how the Inca inaugurated the year's work in the fields by using a golden hoe. Adzes were however used by Inca Indians also for working in wood (GARCILASSO DE LA VEGA, vol. I, p. 202).

The occurrence of the double hafting-groove on the axe-head seen in fig. 125, *g*, may be due to re-hafting, to the handle having been wound a full turn round the blade, instead of the usual half-turn, or, which is more probable, to the haft having been double (cf. HARRINGTON, fig. 45). No independent form is represented by axes of this type, for it should be noted that now and then axes of this shape are met with in areas where axes with a single hafting-groove occur. In this connection APARICIO (3, fig. 19) illustrates an axe with a double hafting-groove from Cordoba, AMBROSETTI (4, fig. 152:18) one from Pampa Grande, in the province of Salta, and in Professor ERLAND NORDENSKIÖLD's collection from Kaipipendi, in Bolivia, another similar one is found (R. M. K. 1380).

Various stone objects.

In addition to the stone finds dealt with above there were also discovered other stone objects of different kinds at the ancient sites. These are illustrated in figs. 126—129.

Fig. 126, *a*. Among stone objects found in the ancient dwelling sites of La Candelaria the one most commonly occurring is depicted in fig. 126, *a* (G.M. 33.15.330). This particular specimen originates from the site at Santa Isabel, but objects of this type were discovered in almost all the ancient sites of La Candelaria. It is of circular section, and its shape, as seen from the figure, is fusiform. These objects are generally of the same appearance as the one here depicted, but occasionally the points are more blunted, and their sides not so well polished. They always consist of some very fine-grained, unstratified kind of rock. The specimen here depicted has a length of 5.5 cm., a measurement which in these implements does not vary by more than 1 cm. either way. Possibly they have been used as missiles for slings, or, although it is less probable, throwing-forks resembling those mentioned by SPEISER (fig. 78: 16) from the Aparai Indians on the border between Brazil and French Guiana. Throwing-forks of this type are also

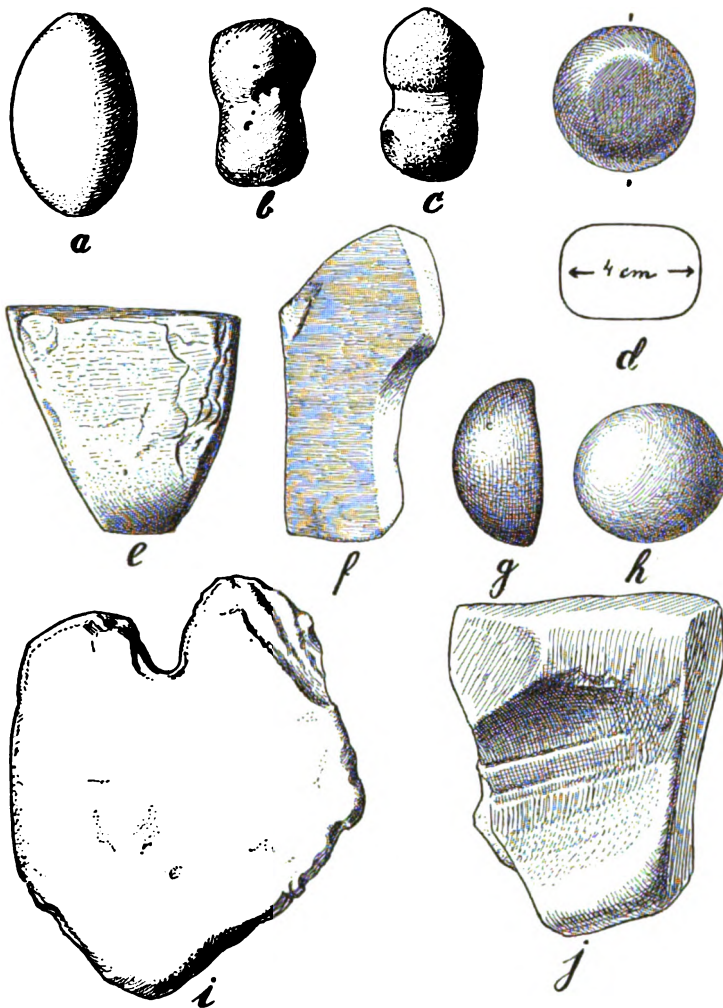


Fig. 126. Stone objects from various sites in La Candelaria.

known to Argentine Indians, viz. the Tobas (RYDÉN, 2, p. 205) although in their case the projectile consists of a small stick. This may be ascribable to the circumstance that the tribe in question inhabits a region entirely devoid of stones. That an object in the shaping and polishing of

which so much care has been expended was meant merely as a projectile — perhaps for using only once, in case it could not be retrieved — is an explanation in itself somewhat doubtful. It should, however, in this connection be mentioned that in New Caledonia sling-stones are given a similar shape (SARASIN, pl. 58: 1). Sling-stones resembling those we are here concerned with are found by ERLAND NORDENSKIÖLD in the San Francisco valley (R. M. 03.3. 7204), as well as having been excavated by TORRES (1, p. 74 and foll.) in the Parana delta. For what kind of hunting such stones may have been used in that region is difficult to ascertain. They cannot very well have been used for water-fowl seeing that the projectiles would have been lost in the water. AMEGHINO (p. 305, pl. XVII:522) in addition illustrates a sling-stone from the northern coast region of Argentina. Having in particular compared this with sling-stones from New Caledonia, the Solomon Islands, etc., he is of opinion that Argentine stone objects of this type should be classed as sling-stones. Sling-stones of this description are also known from Pampa Grande in Argentina (AMBROSETTI, 4, fig. 150: 7—10) as well as from the province of Mendoza (MÉTRAUX, 2, figs. 30—32). In Mojos, where stone is as scarce as in the Chaco, projectiles are made of burnt clay. Thus NORDENSKIÖLD (1, fig. 70) in the earlier stratum in Mound Velarde discovered two objects of a shape similar to that of the sling-stones here referred to, but they were made of fired clay. These, according to him, had been used as sling-stones.

—*b-c*. Whether bolas were ever used by La Candelarian Indians is exceedingly doubtful. The two stones from Agua Dita seen in fig. 126, *b-c*, may possibly have been bola stones although it is just as likely that their shape is a mere accident of nature. I acquired these stones at second hand, and do not know whether they were found together. Each measures 4.5—5 cm. in length. (G. M. 33.15.540—541).

—*d*. The stone object depicted in fig. 126, *d* (G.M. 33.15.714),

originates from Estanzuela. It is 4 cm. in diameter, and consists of some fine-grained kind of rock. Its shape, as seen from the figure, is discoid. Of the two plane sides, one is especially well polished, while, on the other hand, the rounded side appears to have been shaped by pounding. An exactly similar object of stone from the province of Catamarca is now in the collections of the Gothenburg Museum (G. M. 30.29.294).

—*e*, shows a stone wedge found at Unquillo. It consists of some kind of stratified rock, whose lines of cleavage coincide with the edge of the celt. It is 6.5 cm. long and 1.5 cm. wide. Its narrow edges on the right and on the left only show slight traces of grinding, while its broader, and flat, sides, one of which is seen in the picture, are only sufficiently ground for producing the edge at the point of the celt. (G. M. 33.15.479).

—*f*. A whetstone, of small size, made of some fine-grained, calcareous rock, is seen in fig. 126, *f*. Its largest grinding-face is turned into view in the illustration. Smaller grinding-faces are found on the sides of the stones. It has probably been used for putting an edge to stone axes. Length, 9 cm., locality of find, Cuchiyaco. (G. M. 33.15.307).

—*g*, shows a semi-spherical stone of some dark-coloured, very fine-grained kind of rock, discovered at Cuchiyaco. Its shape is probably natural. On the plane, and almost circular, side of the stone — with a maximum diameter of 4.5 cm. — and roughly in the centre of it, is a V-shaped channel. This channel has not been made by the hand of man, but may nevertheless have served for fastening a string for carrying the stone round the neck as an ornament, or the like. (G. M. 33.15.308).

—*h*. The spherical stone seen in fig. 126, *h*, (G. M. 33.15.338), may possibly have been used for weighting bolas, in which case it must have been sewn into a piece of leather seeing that it shows no trace of grooving. A second stone of this appearance was found at the Santa Barbara site, although

in a far distant spot. Both stones consist of fine-grained rock, and measure 4 cm. in diameter. Similar stone balls have also been discovered at Pampa Grande (AMBROSETTI, 4, fig. 151).

—*i*. What purpose was meant to be served by the stone object depicted in fig. 126, *i*, is uncertain. It consists of a 12 cm. long slab of some kind of stratified, and fine-grained, calcareous kind of rock. Its thickness about 1 cm. It was found at Unquillo. The only sign of its having been worked upon consists of a groove worn in the angle of the notched recess at the top. (G. M. 33.15.633).

—*j*. Yet another whetstone is here depicted, fig. 126, *j*. Its provenance is Sta. Lucia. Like the whetstone seen in *f* of the same figure it consists of fine-grained, calcareous rock. It measures 9.5 cm. across its widest part. In the concave grinding-face, in the picture turned towards the observer, three shallow grooves have been worn down. On its reverse side two more concave grinding faces are found. (G. M. 33.15.518).

Fig. 127, *a*, shows a hanging ornament of fine-grained rock, of a dark, reddish colour. It has a length of 6 cm., its section is lenticular, and it measures 5 mm. across its widest part. Its shape, it will be seen, rather recalls an inverted heart, and the perforation for the string used in carrying it is made through the point of the «heart». This hole has been bored from both sides. Diametrically opposite it, i. e. in the nick of the «heart», there is a narrow groove apparently produced by drawing a string to and fro. The edges of the object are all round it provided with indentations which may possibly have been worn down by means of a cord, or, as is more probable, produced with the help of sharp-pointed whetstone. From which site in La Candelaria this object originates is not known. (G. M. 33.15.669).

—*b*. A small stone disk, thin and circular, of fine-grained rock, probably stratified, is depicted in fig. 127, *d*. Its diameter is 3 cm., and its thickness only 3 mm. Roughly in the

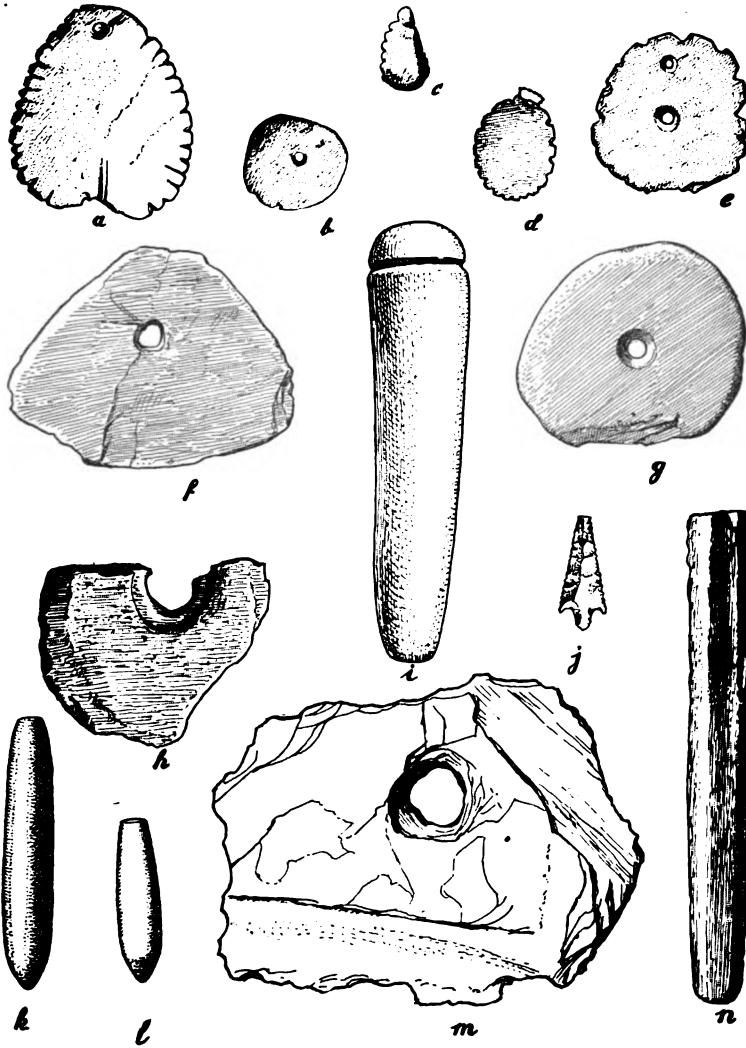


Fig. 127. Stone objects from various sites in La Candelaria.

centre of the disk is a hole, bored from one side. The edge of the disk shows signs of wear. Found at Cuchiyaco. (G. M. 33.15.311).

—*c.* Shows a small hanging ornament of opaque, light-green rock. Round its upper part is a groove for the string by which it was suspended. One of the edges is ornamented with a number of notches. Its length is 2.5 cm., and its provenance Cuchiyaco. (G. M. 33.15.310).

—*d.* Another small hanging ornament, consisting of a flat piece of stone 2 mm. thick. It is 3 cm. long, but will no doubt have been a millimetre or so longer as the projection, to which the string for carrying it was attached, has been broken off. Its edges are notched. It is made of some fine-grained rock, probably unstratified. Provenance, Unquillo. (G. M. 33.15.478).

—*e.* Another ornament, flat, with a thickness of 2 mm., made of stratified rock. At its widest part it measures 4.5 cm. across. Part of the edge is notched, and in the centre as well as near one of the edges is a perforation, bored from both sides. Provenance, Cuchiyaco. (G. M. 33.15.312).

It appears as if notched-edged stone ornaments like those just referred to were typical of ancient La Candelarian culture. SCHREITER (I, fig. 13:2) depicts similar objects from the said region. An example has also been found at Pampa Grande by AMBROSETTI (4, p. 150:2). A bone amulet with similar notches from the delta of the Parana is published by TORRES (I, p. 283, fig. 102).

—*f.* A nearly triangular, flat piece of stratified rock. It measures 9 cm. in its widest part, and is 5 mm. thick. Its only sign having been worked upon consists of a perforation in the centre. Provenance, Caspinchango. (G. M. 33.15.567).

—*g-h.* Apart from a weaver's batten, of bone, to which I shall recur later, I only know of some very few implements from La Candelaria to indicate that textile industry was included in the culture of the Indians that anciently inhabited that region. One such object is a spindle-whorl, fig. 127, *g.* (G. M. 33.15.340) and a fragment of another — possibly a half-finished one — fig. 127, *h.* (G. M. 33.15.475). The

spindle-whorl, *g*, is made of fine-grained rock, probably stratified; its greatest width is 6.5 cm., and its thickness 5 mm. The perforation in its centre, which received the spindle, is bored only from one side. It comes from Sta. Barbara. Fragment *h* consists of a kind of rock similar to that in the foregoing. In its widest part it measures 5 cm., and it is about 1 cm. thick. Its provenance is Unquillo. Spindle-whorls of stone were discovered by AMBROSETTI (4, fig. 150: 4—5) in Pampa Grande, where, as already has been pointed out, also other objects typical of ancient La Candelarian culture were found.

— *i*. The hanging ornament seen in fig. 127, *i*, (G. M. 33.15.341) is made of fine-grained rock. It has a length of 12 cm., measures at its widest part 3 cm., and its section is circular. It has fairly well polished sides, and its lower points terminates in a plane surface. Round the rounded and thicker end of the object a groove has been ground, probably for the purpose of attaching the string by which it was suspended. Its provenance is Sta. Barbara. No parallels to the above finds other than the phallus figures of stone that have been discovered in the Diaguita district are known to me. AMBROSETTI (2, vol. XX, fig. 154) has depicted two such phallus figures, one having been found at Poman, the other (AMBROSETTI, 5, figs. 4—5) at Salinas Grandes.

— *j*. A tanged arrow-head is also here depicted, fig. 127, *j*, (G. M. 33.15.309). This is the only specimen I have myself been able to obtain in La Candelaria. Its provenance is Cuchiyaco. It is made of some fine-grained kind of rock, of a tint between grey and reddish. In its present state it measures 32 mm. in length, and is 2 mm. thick. SCHREITER (1, figs. 13: 6 and 9) has also discovered a few arrowheads in La Candelaria. Two of them are tanged, while a third has an indented base. The meagre total of finds of arrow-heads in La Candelaria indicates that unless the ancient inhabitants in addition possessed arrows with wooden points hunting was of no great importance to them.

— *k-l*. Two stone rods of unknown use are depicted in fig. 127, *k-l* (G. M. 33.15.339 and 476). Rod *k* is from the Sta. Barbara site, while *l* originates from Unquillo. The larger one has a length of a more than 1.75 cm., the other 4.5 cm. Their thicknesses are, respectively, 1.5 and 1.3 cm. They consist of some fine-grained kind of rock, and their surfaces are well polished. One end of each object terminates in a point, while the other is truncated. La Candelarian mestizos call these stone rods «lápiz de los indios». It is possible that these objects were used as ear-ornaments, as in shape they bear close resemblance to ear-ornaments worn by the Kayapo Indians (KRAUSE, p. 98), although in the latter made of wood. LAFONE QUEVEDO (I, pl. XVI: 2) depicts a similar object from the neighbourhood of Andal-gala. He calls it «un haucanqui ó amuleto de amor».

— *m*, shows a flat piece of some fine-grained, unstratified rock. It measures a maximum length of 12 cm., while its thickness is 1 cm. Its only sign of having been worked upon is a perforation near one of the edges. Its provenance is Unquillo, and it probably constitutes a half-finished spindle-whorl. (G. M. 33.15.474).

— *n*. Another unfinished piece of work, probably the raw material of a stone rod of the kind shown in fig. 127, *k-l*, is seen in fig. 127, *n*. In this case the material consists of stratified rock. Its length is 14 cm., and it measures 2 cm. in its widest part. The lower part of it is round, while at the top it is more irregularly shaped. Provenance, Toro Loco. (G. M. 33.15.324).

Among stone objects may lastly be mentioned two human figures, figs. 128—129. The one in fig. 128 lacks the head, and only the upper part of the body, with the arms, is fully sculptured. Not much care has been bestowed upon fashioning the back of the figure, where in parts the natural surface of the stone is left unworked, as it seems. On the front side there is a pronounced ledge, somewhat in the way of a plinth, at the foot of the figure. Nothing corresponding

to this appears at the back. The arms are carved in fairly high relief, while the hands are only slightly raised above the surface. The material consists of a whitish, non-calcareous kind of rock, with a few dark stripes that are most marked on the rear side. The height of the object is 17 cm., and in its thickest part it measures 7 cm. Its width is 12 cm. Its exact provenance is not known. In this stone figurine the face is unfortunately missing, and only the posture of the arms is of any help in comparing it with other finds. It often occurs in human representations from the Diaguita district that arms and hands are posed in an attitude more or less recalling that seen in the stone figure here published. This will be apparent from a comparison with an image from Suajil de Pomán, published by QUIROGA (1, fig. 21), and the same can be said of another stone image from Casabindo (AMBROSETTI, 5, fig. 3). AMBROSETTI (2, vol. XX, fig. 226)



Fig. 128. Stone figure from La Candelaria. (G. M. 33.15.668).

depicts an earthenware vessel from Andalguala with a similar posture of hands, BOMAN (2, pl. XXVIII, c) has published an earthenware figure from Aimogasta, La Rioja, exhibiting similar features, which are also found in a wooden figure published by DEBENEDETTI (6, p. 12, fig. 6). The instances just mentioned will suffice to establish the correspondence existing between images from the Diaguita district and La Candelaria, respectively. And Debenedetti quite rightly remarks that they are very common in the Calchaqui district. An earthenware human figure from La Candelaria holding its arms in a similar posture is depicted in fig. 132.

Of the two stone figurines mentioned above, the second

one is seen in fig. 129. It is made of a grey-coloured, fine-grained kind of rock. The long hair indicates that a woman is meant to be represented. The face, as well as the hair, is sculptured in low relief, while the object carried by the woman in a string round the neck (a satchel?), the cap, the lines indicating the hair, and the zigzag lines on the back below the hair, are executed in fine, incised lines. From the

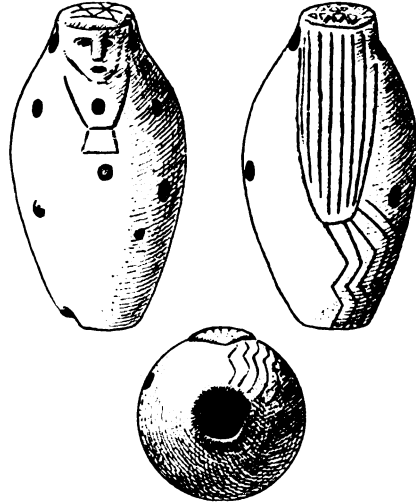


Fig. 129. Stone figure from La Candelaria. (U. M. o. T.)

bottom of the figure a hole of 12 mm. diameter has been bored almost all the way through the longitudinal axis of the figure. On the outside of the figure eleven depressions have been bored which are disposed in the way seen in the illustration. The two depressions that are sunk in the places where the ears should have been measure 4 mm. in diameter and are 5 mm. deep, which makes them reach almost to the channel bored along the longitudinal axis of the figure. Of similar dimensions are the two depressions found in the lower part of the back of the figure, as well as the lowest one on the right in the picture, which shows the front of the image. The rest of the depressions are of a similar diameter, but only 2—3 mm. deep.

VI.

Detached earthenware finds (other than vessels).

Apart from clay vessels, from the ancient sites of La Candelaria I only know of a small number of earthenware objects.

Fig. 130 shows an earthenware object of unknown use. It has a length of 13 cm., and its shape will be apparent from the illustration. As will be seen, near one end of the object there has for its suspension been bored a hole, judging by everything pierced through it prior to its being fired. The ware is of a greyish colour. As is also apparent from its section, two of the adjacent projecting ridges are more flattened than the other two. It is probable that the object rested on that side while being put out to dry preparatory to the firing. From Argentine territory I know of nothing corresponding to this object. LINNÉ (I, fig. 12, d) however depicts an object from Puturgandi (Panama) that in shape much recalls the one here illustrated.

In my collection are also included two fragments of tobacco pipes made of clay. One of these consists of the stem, an unornamented earthenware cylinder 12 cm. long (G. M. 33.15.473). Its diameter is 2.7 cm., and that of the smoke channel 1.5 cm. It is of greyish black ware, with slip-finished surfaces. Its provenance is Unquillo. The second tobacco pipe fragment consists of the bowl along with part of the stem. Its appearance will be evident from fig. 131, *a—b*.

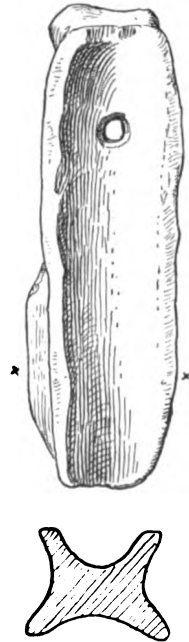


Fig. 130. Earthenware object of unknown use. (G.M. 33.15.621)

As is seen from the figure, the bowl carries anthropomorphic ornamentation. In addition, below the bowl the pipe is provided with two feet, enabling it to be placed in an upright position. The stem is decorated with a triple zigzag line. As is evident from its section, depicted in fig. 131, *b*, neither the height of the bowl nor the shape of the stem are ascertainable. In its present state the stem is 7 cm. long. The ware of which it is made is of a greyish brown

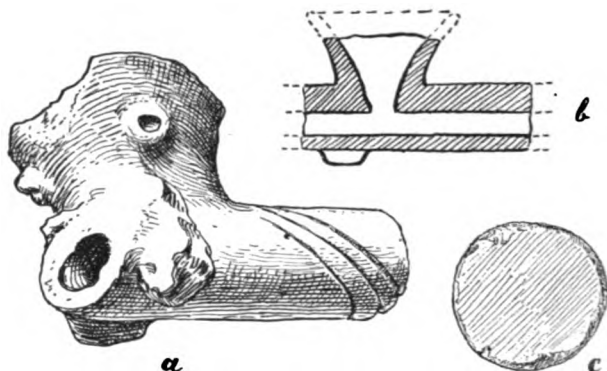


Fig. 131 a. Fragment of earthenware pipe from La Junta, La Candelaria, b. vertical section of the pipe, c. earthenware 'man', or counter for use in game. (G.M. 33.15.328, 318)

colour and rather coarse, so that even with the naked eye it is possible to discern the added ingredient which consists of mica-schist. On the surface it is much decayed by weathering.

Earthenware tobacco pipes are typical of northwestern Argentina. A posthumous work by ERIC BOMAN (9) deals in detail with the occurrence of the variants of this type of tobacco pipe. The pipe-bowl fragment here dealt with proves, together with a large number of other details, the existence of a certain connection between the cultures of La Candelaria and the Diaguita region (MÉTRAUX, 4, p. 187).

In fig. 131, *c*, is depicted a game-counter manufactured from a potsherd. The work expended on it has been limited to

making it as circular as possible. Its diameter is 3 cm. Similar game-counters made of stone also occur in South America. An earthenware game-counter from La Rioja is mentioned by BOMAN (2, fig. 60). ERLAND NORDENSKIÖLD (16, pp. 19-20), collected game-counters of stone from the San Francisco valley (R. M. 03.3. 7124—7125). In this connection Nordenskiöld describes how game counters are used in the Tarija Valley, in Bolivia, and further that Indian boys in Puna de Jujuy, in Argentina, practise a game in which they throw similar counters into a pit, that is to say that the game in question no doubt resembles the one described below from the Toba Indians. By Nordenskiöld archaeological game-counters of stone or clay have also been collected from the following sites in Bolivia: Quinales, in the Misque valley (G. M. 15.2.23), Navidad (R. M. T. 80 and 84), Curicha on Rio Guaporé (R. M. T. 79), Charagua (R. M. R. 141, 142 and foll.), Tarupayo (G. M. 15.2.41 and 61), Kaipipendi (G.M. 16.12.8 and R. M. K. 198), and, lastly, also from Mound Velarde in Mojos (R. M. T. 784). The above-mentioned places are found on a map attached to each of two works by NORDENSKIÖLD (2 and 3). MONTELL (2, fig. 54) illustrates a stone object from Rio Loa Valley, in Atacama, which probably constitutes a game counter. LINNÉ (3, p. 122 and foll.) has discovered game-counters in his excavations at Teotihuacan in Mexico. He also describes (from RUSSEL, 1, p. 177 and foll.) how game-counters of this type are used by the Pima Indians. To this day one may observe Chaco Indians using game-counters made from sherds of broken clay vessels, like the one here depicted, although of a diameter a centimeter or so larger. Thus, among the Toba Indians, in preparation for the game a small pit (*lait*) is dug in the ground, about 1 dm. in depth and about 25 cm. in diameter.



Fig. 132. Clay figure
La Candelaria.
(G.M. 33.15.688).

Each child taking part in the game is provided with a counter, and the players place themselves 6—7 m. away from the pit and try to throw the counter (*sogole*) into it. The player that first succeeds in placing his counter in the pit is the winner. In case all the counters land outside the pit, each player in turn tries, with the second finger against the thumb, to flick his counter into the pit. This game is called "*sogolei*".

Lastly, in fig. 132 a small figurine of brownish ware is depicted. As is apparent from the picture, it has been badly damaged. It can however be observed that its arms are posed in the same way as in the stone figure described above (fig. 115). Its height is 6.5 cm., and it is 1 cm. thick. From which of the La Candelarian sites it originates I do not know.

VII.

Objects made of shell.

In fig. 133 are depicted a series of shell finds of which nothing is known beyond their having been found inside sepulchral urns in La Candelaria. They are of a chalk-white colour, and, through weathering, their surfaces have assumed a chalk-like consistency. Dr. NILS HJ. ODHNER, of the National Museum of Natural History at Stockholm, has been kind enough to examine my mollusc material in detail. His report, dated April 3rd, 1935, reads as follows:

"The smaller test sample (fig. 133, *d*), which consists of three shells, appears to represent *Olivia oribignyi* MARRAT, a species said to occur on the Patagonian coast. (Unfortunately no authentic material was available to Dr. ODHNER for comparative purposes).

The remainder of the rings (fig. 133, *a—c*) that are composed of shell fragments evidently derive from one and the

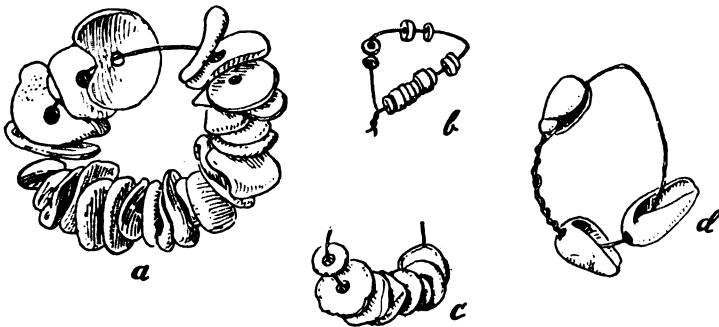


Fig. 133. Shell ornaments from La Candelaria. (N. B. strings not authentic. G.M. 33.15.700—703).

same species, viz. *Strophochilus oblongus*, a land mollusc (formerly known as "*Balimus oblongus*") widely distributed over South America, from New Granada and Guiana to Rio Grande do Sul and Uruguay. The flat and multi-grooved, circular disks (fig. 133, *c*) on one of the rings are fragments of that portion of the last whorl which is located next to the suture. The mark left by the preceding whorl is distinctly visible on the inner side of the edge. Their exterior sculpture is entirely identical with that found on the shell of this species. The larger pieces on the second ring (fig. 133, *a*) derive from the rim of the shell mouth. The broad ridge at one of the edges is identical with the broadly shaped lip of the shell. This lip is of a beautiful rose-red colour, and may on that account have attracted the attention of the Indians.

The small disks (fig. 133, *b*) have quite certainly formed part of the columella (spiral pillar) of the shell here concerned, and were originally of a rosy colour."

In this connection a shell fragment found in urn 9, from Huanacocha (pp. 113—114) may perhaps also be mentioned. Dr. ODHNER has determined this fragment as part of the orificial rim of *Strophochilus oblongus*, and, as the rest of the shell has been smashed away, there is justification for supposing it to be a piece of débris.

The fragments seen in fig. 133, *c*, are executed with greater care than the rest. They are of a fairly symmetrical round shape, contrary to the remainder which are more irregularly formed. In these shell ornaments, which probably were used in the way of beads, the diameter varies between 3 and 5 mm. As regards the shell ornaments, fig. 133, *a* and *c*, these were probably used either as spangles, or as "beads" in a necklace, and then probably threaded on a string in the way usual in the Chaco, as illustrated by NORDENSKIÖLD (6, fig. 33). For fastening spangles on a cloth underlay, two methods are known from Argentine regions, one illustrated

by NORDENSKIÖLD (6, fig. 32), and the other by VIGNATI (1, pl. I and II).

The distribution of shell spangles in Argentine regions has been studied by VIGNATI (1, fig. 6) who, on the basis both of archaeological finds and of earlier as well as later data in the literature, has established the occurrence of shell spangles in practically every province of Argentina. NORDENSKIÖLD (6, p. 124 and foll.), and RIVET and VERNEAU (p. 529 and foll), give accounts of the occurrence of these ornaments

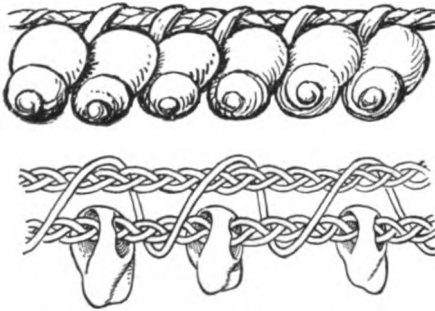


Fig. 134. Picture showing the Ona Indian method of stringing shells into necklace. The shells are from *Photinula violacea* KING. (G. M. 29.14.5).

in regions outside Argentina. Especially in the Chaco it appears that shell spangles and "beads" of the same material are common, and also that their distribution in South America is confined to the western parts of the continent.

Of especial interest is the authenticated occurrence of *Olivia oribignyi* MARRAT in La Candelarian graves. As this mollusc is found on the Patagonian coast, the find just referred to goes to prove that the ancient Indians of La Candelaria also maintained commercial relations in a southerly direction. These shells probably constituted hanging ornaments, and the thread was passed through the shell in the way seen from fig. 133, *d*. There was this difficulty about shell necklaces that certain measures had to be taken in order to secure uniformity in the row of shells. To this end

the Ona Indians of Tierra del Fuego begin by threading the shells on a cord plaited of three sinews. In their case the shells consist of *Photinula violacea* King. A second plaited cord, similar to the one carrying the shells, is then firmly secured to the latter by means of a length of sinew, in the way seen in fig. 134, *b*. Thus the shells are kept in their

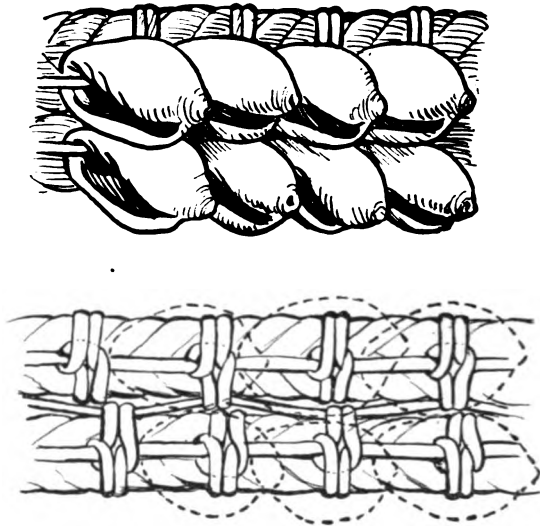


Fig. 135. Detail of a necklace from Nasca, Peru. (G.M. 32.17.117).
Scale 1/1.

proper places on the cord. Exactly the same method of securing the shells is also known from the Basket-makers, in Arizona (KIDDER and GUERNESEY, fig. 73). Fig. 135 shows a detail of a necklace, 30 cm. long and 2 cm. wide, from Nasca, in Peru (G. M. 32.16.117), where a similar method of keeping the shells in position is observable. DOELLO-JURADO (p.438) depicts shells of a different species (*Littorina peruviana*) from Parada Cadillal, in Tucuman, that apparently were secured by the same method as that practised by the Ona Indians. Duello-Jurado points out that this shell in our days occurs on the South American Pacific coast, from Central

America and down to central Chile. The present specimen was discovered by Professor R. SCHREITER in the course of some archaeological exploration, of which however no particulars are given. The find in question may however constitute evidence of commercial intercourse having existed in early times between Indians of Tucuman and inhabitants of the Pacific coastland. In conclusion it should be mentioned that NORDENSKIÖLD (16, p. 12), when examining a sepulchral urn at Arroyo del Medio, east of the San Francisco Valley in northwestern Argentina, came upon shells of the *Olivia* species, from which it may be inferred that also in this region of northwestern Argentina trading intercourse, similar to that found in La Candelaria, prevailed.

VIII.

Objects of bone.

Of archaeological bone objects, I know of three instances from La Candelaria. As regards one of them, the weaver's batten in fig. 136, *a*, I only know that it was discovered in La Candelaria. The other two bone objects, fig. 136, *b* and *c*, came into my possession by purchase, along with some pottery fragments, at a puesto known as Sta. Lucia on the northeastern side on Loma Colorada (cf map, fig. 6). This puesto was, as already mentioned (p. 120), situated some way up the mountain slope, which, above the puesto, had evidently in ancient times formed an Indian settlement ground. It was in this spot that my above-mentioned purchases had been collected, washed into view by rain floods.

Dr. WALTER KAUDERN, director of the Ethnographical Department of the Gothenburg Museum, has done me the favour of examining the bone objects in question (cf. Appendix II, find G. M. 33.15.516). The one denoted as *c*, probably consists of a bone of guanaco. As mentioned above (p. 68), bones of guanaco also was found at Sta. Barbara, and it would therefore seem probable that that animal was hunted by the Indians of ancient La Candelaria. Since then the guanaco has become extinct in those parts, but local tradition still preserves the memory of its existence (SCHREIER, I, p. 54).

The only sign of handiwork observable in the bone object, fig. 136, *a*, which consists of a scapula, is limited to marks from wear in the lower part of the left-hand edge, and a few grooves running parallel with the edge. The right hand side

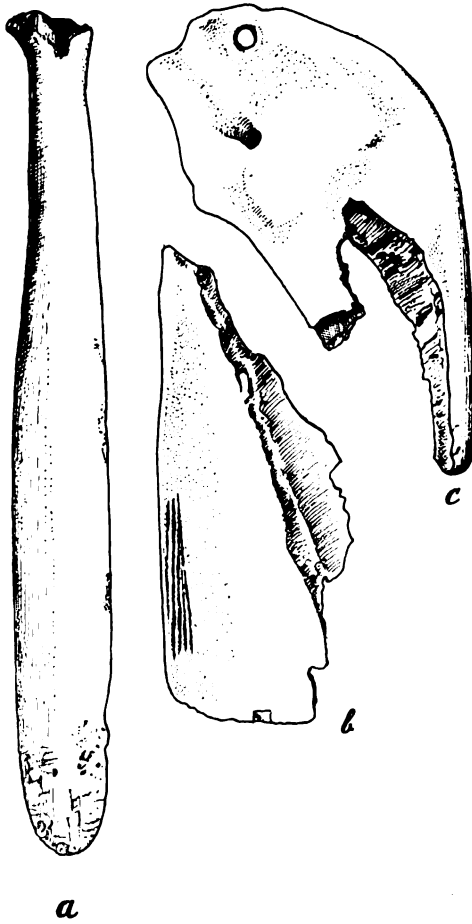


Fig. 136. Bone objects. *a*. from unknown locality in La Candelaria, *b*—*c*. from Sta. Lucia. Scale $\frac{1}{2}$. (G.M. 33.15.699, 516—517).

— i. e. the side away from the teeth — of the jawbone, is much worn especially at its point, and there is in addition a perforation at the top. It is difficult to determine what may have been the uses of these two bone implements, *b* and *c*, although, judging by the marks of wear, it is probable that they were used in polishing clay vessels.

It may also be mentioned that DEBENEDETTI (1, p. 48) at his excavation of Pucará, among the ruins of a house found a solitary scapula, but whether any artificial marks could be seen on it he does not say. The sporadic occurrence of a bone of this character in a dwelling site may, however, point to the object having served some definite purpose.

IX.

Objects of metal.

During my stay at Toro Loco I received as a gift a nearly square metal plate, which constitutes the only archaeological metal object known to me from La Candelaria (fig. 137). It measures 4 by 5 cm., is about 1 mm. thick, and has very sharp edges. Close to one of its shorter sides is a perforation, and, judging by the marks of wear in this, it seems probable that the plate was worn as a neck ornament. According to what I was told by its donor, the object in question had been discovered, a year or two prior to my visit at the place, inside a sepulchral urn located immediately east of the dwelling house at Toro Loco. When I visited the spot indicated, the wash of rain floods had, however, already obliterated every trace of the urn, and only two or three fragments of the kind of pottery that is typical of the large sepulchral urns could be found in the vicinity of the burial site in question. As I have already remarked, this is the only metal object known from ancient La Candelaria, and one is therefore justified in supposing that there was no appreciable knowledge of metals in the ancient culture of La Candelaria. This solitary metal object was of course nothing but an ornament, and, as we know, when metals first become introduced to a people, they appear in the character of ornaments.

The Public Analyst of Gothenburg, Dr. G. KARL ALMSTRÖM, has been kind enough



Fig. 137. Metal plate found inside a sepulchral urn at Toro Loco. La Candelaria. (G. M. 33.15.319).

to examine the metal object here referred to chemically. He makes the following report:

"Report No. 15, 509.

On August 14th, 1935, I received from the Gothenburg Museum a test sample consisting of an object of bronze, marked '33. 15. 319'. On being analysed, the said sample was found to contain:

Tin, to a proportion of 8.67 %.

The sample showed no trace of gold.

Gothenburg, August 29th, 1935.

(sgd.) G. KARL ALMSTRÖM."

As will be apparent from the above analytical report the metal object here referred to is of a character similar to that of the general run of archaeological metal objects from northwestern Argentina in that it contains tin (NORDENSKIÖLD, 14, p. 73).

The above bronze plate does not in itself offer many points of comparison by reason of its being entirely unornamented, but it may however be mentioned that unornamented plates of this type were worn by the Indians of the highland region in northwestern Argentina. BOMAN (1, vol. I, fig. 56) depicts a similar metal plate from Morohuasi, and a number of others from Tinti, in Valle de Lerma, have been published by the same writer in another work (BOMAN, 6, fig. 3). DEBENEDETTI (1, pp. 41 and 51) found some in his researches at Pucará, while BRUCH (2, fig. 25) discovered a plate of this type in question in a grave at Hualfin, in Catamara. In his researches at La Paya, AMBROSSETTI (6, fig. 222) found several metal plates resembling those which are here illustrated, though his were larger. Ambrosetti calls them "placas pectorales".

In this connection may also be pointed out the difference

existing between La Candelaria and its near-related site, Pampa Grande, as regards finds of metal objects. From the latter site finds are more numerous, and are also artistically ornamented. They are of Diaguitan character, and therefore ascribable to Diaguitan influence in Pampa Grande (AMBROSETTI, 4, figs. 156—160).

X.

Discussion of the archaeological material with regards to the bearers of the culture.

In the foregoing I have repeatedly called attention to points of correspondence between the La Candelarian finds and AMBROSETTI's (4) finds from Pampa Grande. The clay-vessel type dealt with on page 139 and following (fig. 81, *a—b*), must be regarded as especially characteristic of ancient La Candelarian culture, and in that connection I pointed out how the distribution of that type is limited to the province of Tucuman. In the following I shall have occasion to refer to further archaeological finds that must be coordinated with those from Pampa Grande and La Candelaria. The object I have in view is an attempt to establish the limits of the geographical distribution of the culture we are here concerned with, the identity of the people who were its bearers, and, if at all possible, to date the period of that culture.

In 1901 at El Carmen and Providencia, in Valle de Lerma, province of Salta, BOMAN (1, vol. I, p. 255 and foll.; 7, pp. 1—14), discovered three urns, one of which as regards its shape closely resembles the one seen in fig. 73. As in the La Candelarian urn, the wall of the vessel is striated. For a lid, it had an upturned earthenware bowl of undefined shape. The urn contained skeletal remains of an adult individual who had been buried in a huddled posture. In this connection Boman mentions that he had heard of other finds of a similar character in that neighbourhood, viz. at Carbajal and La Cañada. He also cites (BOMAN, 1, vol. II, p.

258) an earlier statement as to sepulchral urns having been discovered within the town of Salta itself in 1791 (*Mena, Filiberto de*: *Relacion en que se explican los monumentos o vestigios que conserva esta Intendencia, del ingenio, industria y fortificacion de esta fertilisima region*. Dated at Salta, 22 November 1791. This manuscript has been published by Dr. V. G. QUESADA in "Vida Moderna" for March, 1903; Montevideo, 1903). The finds from Providencia, near San Pedro, consisted of some ten urns of a character similar to that of the urns from El Carmen, and also contained bones of adult individuals. The urns were closed up by means of a second urn being placed, upside-down, over the mouth of the sepulchral vessel.

Boman was of opinion that these finds proved the former existence of Guarani Indians in the Salta district, and subsequent finds of this type have been similarly explained, as, e. g., by TORRES (2) in the case of the large sepulchral urns that, in 1917, he discovered near Rosario de la Frontera.

Among these finds of alleged Guarani origin, the most important are, however, those from Pampa Grande, to which reference has repeatedly been made. These finds were published by AMBROSETTI (4) in 1906, that is to say a couple of years after Boman had made public his discoveries in Valle de Lerma.

The great importance of the Pampa Grande finds lies in their constituting one of those rare cases where it has been possible to attain a relative chronological determination of the two cultures that are represented by the finds. AMBROSETTI (4, p. 194) summarizes the result of his researches as follows:

The Pampa Grande finds may be divided into two categories:

- A. Sepulchral urns and pottery fragments of comparatively crude workmanship, like those found by Boman in Valle de Lerma, and
- B. Urns and other objects of pure Calchaqui type.

The former category predominates as regards numbers, and its sepulchral urns are *always* found below those of Calchaqui type, which means that they are older than the Diaguitan finds of Pampa Grande (AMBROSETTI, 4, p. 195). The La Candelarian finds have their counterparts in group A.

AMBROSETTI (4, p. 35) mentions, however, an instance where in an urn of the earlier culture stratum a clay vessel of Sta. Maria type was found. This AMBROSETTI (4, p. 195) puts down to mere chance — by earth-pressure from above, the Diaguita vessel must have been forced down into the older vessel.

A further case of similar character is however known to me. In the foregoing (p. 116 and foll.), I mentioned a sepulchral urn that had been discovered by AMBROSETTI (3, p. 62) at Quilmes, and which is here reproduced in fig. 66. In that connection I pointed out that we possess the only known counterpart of that vessel among the La Candelaria finds (fig. 65), and that, therefore, both vessels most probably belong to the one and the same culture, i. e. the La Candelarian culture. Among the mass of Quilmes finds this vessel, and one or two others, are aliens. The Quilmes urn, like the above-mentioned urn from Pampa Grande, contained a clay vessel of Santa Maria type, within which were found skeletal remains of a very young individual. As the earlier culture stratum at Pampa Grande and the La Candelarian finds belong to the same culture it follows that the La Candelarian finds may be older than the Diaguitan culture.

Neither in La Candelaria nor in Pampa Grande have any finds of Incan origin been made, nor have there been any discoveries pointing to European influence (AMBROSETTI, 4, p. 18). MAX UHLE (2, p. 513) points out this fact in connection with the Pampa Grande finds, and after having analysed Ambrosetti's finds from "La Paya" (AMBROSETTI, 6), Uhle arrives at the conclusion that urn-burial in vessels of Santa Maria, or similar, type fell into desuetude during the era when Incan influence

began to become active in northwestern Argentina, or perhaps even earlier. The La Candelarian finds are thus datable to the pre-Incan period.

The above-mentioned two urns from Quilmes and Pampa Grande, respectively, which both contained vessels of Santa Maria type, tend however to prove that the La Candelarian and the Diaguitan cultures existed side by side during a certain period of time. For I cannot believe that earth-pressure can accidentally have placed Santa Maria urns within Quilmes urns, as has been supposed by Ambrosetti. It is also possible that the Indians that were the bearers of the La Candelarian culture in Pampa Grande, may in that region have been compelled to give way to Diaguita invaders, and the archaeological relics of the latter ethnic stratum would then have been deposited in Pampa Grande while the La Candelarian culture continued its existence in the region east of Pampa Grande. It should be noted that the only find of indisputably Diaguitan character that so far has been made in La Candelaria consists of the sepulchral urn depicted in fig. 120. That the Calchaqui Indians were in the habit of making raids on the plain-dwellers in the east has been mentioned by NARVAEZ (p. 148), and then Pampa Grande must naturally have been more exposed than La Candelaria on account of its closer vicinity to the Calchaqui valley. I shall recur to this point below.

I do not even know of a single find from La Candelaria or Pampa Grande representing the so-called draconic style. This style is considered as having been the earliest in northwestern Argentina (UHLE 2, p. 514), and as being older than the finds of Santa Maria character. Mention must however be made of the criticism that BOMAN (5) applies to the relative chronology of the finds from northwestern Argentina that has been constructed by Uhle and other scientists. BOMAN (5, p. 27) in regard to this takes the view that the draconic and the Santa Maria styles were contemporaneous, and that they only represent two different regional styles from the

Diaguaita district. Moreover, it has been shown by BOMAN (5, p. 20) that burial in urns of Santa Maria type did not — as Uhle supposes — fall into desuetude at the same time as Incan influence began to assert itself in northwestern Argentina, but that it continued even some time after the era of the Spanish conquest. Boman bases his assertion mainly on the excavations that DEBENEDETTI (7, cf. also OUTES, 2) carried out at Caspinchango, in the Province of Catamarca. For the relative dating of the finds from La Candelaria we thus only possess one actual landmark, which is that, thanks to the Pampa Grande finds, those of La Candelaria in most cases may be determinable as being older than the finds of the Santa Maria type. The exact age of the urns of the Santa Maria type that have been found in Pampa Grande is however uncertain. The absence of Incan finds leads Uhle to assign them to pre-Incan times, a theory which in this case may possibly be correct. However, as has already been pointed out, Boman has shown that sepulchral urns of the type in question were in use even after the Spanish conquest, and the absence of Incan finds in Pampa Grande may therefore only be due to the archaeological sites concerned having been situated outside the region of Incan influence.

Of archaeological finds most closely related to those of La Candelaria, the finds published by Boman, Ambrosetti and Torres are the most important. Even some other, sporadic, finds may be worthy of mention in this connection as a help in establishing the distribution of the La Candelarian culture. At a place known as Timbo Nuevo, about two miles north of Tucuman, I had occasion to excavate a sepulchral urn, which was in a very bad state of preservation (fig. 138). The urn in question was discovered in the cutting made in digging deep trenches round a rabbit farm. Nearly one-half of the urn had in that operation been cut away, so that the wall of the trench practically presented a vertical section of the urn. The portion of the urn that had



Fig. 138. Sepulchral urn in course of excavation. Timbo Nuevo at Tucuman.

been dug away was to be found in the soil that had been shovelled up. The upper section of the vessel was missing. In its reconstructed state the preserved part of the urn constitutes the bottom portion below the handles, and resembles much the urn depicted in fig. 64. The part preserved has a height of 40 cm., and its diameter is of the same measurement. The ware is about 7 mm. thick, of a greyblack colour, and with its outer side distinctly slip-coated. On its outer side the bottom is somewhat rugged. Inside the urn skeletal remains were found, probably from an individual of less than adult age.

The Museum für Völkerkunde, Berlin, possesses a sepulchral urn (V. C. 1241) from San José, near Trancas in the extreme north of the province of Tucuman. In shape this urn closely resembles the one depicted in fig. 67. The Trancas urn lacks, however, a waist, but is on the other hand ornamented on its neck, below the mouth region, with a series of parallel wavy lines. On neck fragments from Agua Chica in La Candelaria I have occasionally observed zigzag lines that were wavy (G.M. 33.15.570—571). In the foregoing refe-

rence has already been made to certain other sporadic finds, resembling those from La Candelaria, which have been discovered in the region at the foot of the Andes and between the towns of Tucuman and Salta.

Thus the distribution area of finds of La Candelarian character may properly be said to extend in the form of a strip along the foot of the Andes, from the region of the city of Tucuman northwards as far as the town of Salta. The eastern extension of La Candelarian culture cannot be ascertained, as the region immediately east of Sierra de Medina is still terra incognita from an archaeological point of view. The archaeological finds that have been made by EMILE and DUNCAN WAGNER in the province of Santiago del Estero, southeast of the La Candelarian culture area, have been proved to represent a culture of very marked divergence from that of ancient La Candelaria, but which in its turn presents certain points of correspondence with the Diaguitan culture. The extreme eastern chain of the Andes in the provinces of Tucuman and Salta appears to constitute a natural border line for the western spread of La Candelarian culture. In Pampa Grande we have however seen that the Diaguitan culture has transcended this border line and spread eastwards. Of purely Diaguitan character, the farthest easterly find known is no doubt the urn from Sta. Barbara that is depicted in fig. 120. On the other hand it is also possible to point to certain finds from the regions west and northwest of this border line that seem to indicate that the La Candelarian culture, too, has extended beyond it. A find of that kind is the urn, already referred to on two occasions, that Ambrosetti discovered at Quilmes (fig. 66). AMBROSETTI (3, p. 63) publishes further two urns from Quilmes, strongly divergent from the remainder of the finds from that locality, and which he connects with the Pampa Grande finds. One of the sepulchral urns in question is ovoid in shape, and so is the other one, but it has in addition a small and flat bottom. The latter vessel bears the ornamentation

that is typical of La Candelarian urns, viz. a zigzag line below the rim of the mouth. Both vessels are provided with crescent-shaped ridge handles. Judging by their description, the ware appears similar to that common in La Candelaria, and the surfaces are besides striated. When discovered, the urns were covered with lids, of which, however, no description is given. One of these urns contained skeletal remains of a child, together with a small bowl also provided with crescent-shaped ridge handles.

Here it may perhaps be suitably pointed out that in the case of Quilmes there is the possibility of cultural impulses having been received from the west, in particular from Chile. It may be noted that LOZANO (2, vol. IV, pp. 8—9) states that, according to tradition, the inhabitants of Quilmes originated from Chile. They are said to have abandoned the region in which they were originally settled in preference to submitting to the dominion of the Inca Indians. They moved eastwards and became involved in wars with the Calchaqui Indians, but were allowed to settle in Quilmes upon their adversaries having learnt that they possessed a common enemy, viz, the Inca Indians. I am however not aware of the existence of any Chilean finds corresponding to those here dealt with.

In the case of find No. 6 from El Morro, at Isla de Tilcara, in Quebrada de Humahuaca, DEBENEDETTI (4, p. 36) points out correspondences with finds from Pampa Grande, in that he says: "Este fué un yacimiento singularísimo, único en este lugar, que recuerda en algo á algunos de Pampa Grande, donde se han encontrado esqueletos contenidos en grande urnas preparadas para llenar esos fines". Also from burial ground A., DEBENEDETTI (4, pp. 39—40) mentions a sepulchral urn which shows points of correspondence with finds from Pampa Grande. LAFONE QUEVEDO (2 and 3), finally, discovered at Chañar-Yaco, in the province of Catamarca, urns that contained skeletons of adult individuals. In this particular, i. e. as regards the mode of burial, we find

agreement with La Candelaria, but otherwise the Chañar-Yaco finds are considerably divergent. The resemblance existing between a certain painted vessel from Chañar-Yaco (LAFONE QUEVEDO, 2, fig. 5, f) and the painted vessel from La Candelaria, fig. 103, a, I have already pointed out. TORRES (2, p. 14) moreover stresses that the Chañar-Yaco find must differ as to origin from Boman's find from El Carmen, and Ambrosetti's from Pampa Grande.

Boman supposed the El Carmen and Providencia finds to constitute evidence of the ancient existence of Guarani Indians in northwestern Argentina. He based this theory of his principally on the fact that adult individuals were buried in urns. Among the Diaguita, only young people were buried in this way, and examination led Boman to believe that direct urn-burial was peculiarly characteristic of Guarani culture (BOMAN, 1, vol. I, p. 262 and foll.).

In our days the Chiriguano Indians constitute the Guarani tribe that lives nearest to the distribution area of ancient La Candelarian culture. The Chiriguano have only occupied their present settlement area since the beginning of the 17th century (NORDENSKIÖLD, 8, p. XII). As regards the finds from Pampa Grande, where — as in La Candelaria — direct urn-burial of adult individuals was practised, Uhle, as already mentioned, has pointed out the absence of Incan ceramics, and this circumstance has contributed to the conclusion reached by NORDENSKIÖLD (8, pp. 189—190) that, as urn-burial already in pre-Incan times existed both on the Peruvian coast and in northwestern Argentina, urn-burial of adults is not typical of Tupi-Guarani tribes in particular. Urn-burial of adults is, however, in South America a western culture element that has spread to the eastern coast of the continent, but subsequently, thanks to the Chiriguano Indians, restored to the western part of South America. OURES (4, p. 150) too, has on an earlier occasion opposed Boman on this point, and latterly MÉTRAUX (4), partly on the basis of the material here published, has reviewed the problem

anew. MÉTRAUX (4, p. 185) comes to the conclusion that the *only* feature that the La Candelaria culture possesses in common with the Guarani culture is the direct urn-burial of adults, and that the La Candelarian culture, many divergences notwithstanding, nevertheless presents greater affinity with the Diaguitan culture. He points out that, e. g., handles are never found on the sepulchral urns of the Guarani Indians. Neither is in La Candelaria found the finger-impressed ornamentation that is largely typical of Guarani pottery. As bearers of the La Candelaria culture, Métraux put down the *Lule-Tonocote Indians*. The distribution area of finds of La Candelarian character roughly coincides with the region inhabited by this ethnic group at the time of the Spanish Conquest, as appears from statements found in the early literature, but this circumstance, together with one or two correspondences already cited between finds and data found in the literature concerning the Lule-Tonocote Indians, nevertheless constitute the only facts that speak in favour of such a supposition.

The ethnic conditions that prevailed in northwestern Argentina at the time of the Spanish colonization have been studied in detail by BOMAN (I, vol. I, p. 3 and foll.), and the account that I shall give here will therefore consist only of a recital of the data collocated by BOMAN (vol. I, p. 43 and foll.).

As regards the names "Tonocote" and "Lule", a certain degree of confusion prevails. It is however, not so very difficult to determine the people referred to under the former of these names, »*Tonocote*«. NARVAEZ (pp. 146, 148—149) says that, at the close of the 16th century, the Tonocote Indians were under the patronage of the Spanish settlers of Santiago, Tucuman and Esteco. Narvaez' contemporary, BARZANA (p. LIV) says that Tonocote was spoken by all Indians dependent on the Spaniards of Tucuman and Esteco, by nearly all of the tribes settled on Rio Salado, and that, besides, this language was spoken by five or six tribes on Rio

del Esteco (Rio Dulce). **TECHO** (vol. 1: 1, chaps. XXIV, XXV and XXXI) confirms the statements made by Narvaez and Barzana. He further says that in 1586 Barzana missionized the Indians around Esteco in the Tonocote language. Tonocote was also spoken by the Indians around Santiago del Estero and on Rio Salado. This means that Tonocote Indians inhabited the plains of the entire present-day Argentine provinces of Salta, Tucuman and Santiago, except for the extreme south of the last-mentioned province, where the Sanavirones were settled. By several early writers the tribes we are here concerned with were called "Juries". **BOMAN** (1, vol. I, p. 41 and foll.) has shown that the latter appellation did not denote any particular ethnic group in northwestern Argentina, but the Indian population in general.

MACHONI (p. 32) relates that the Tonocote Indians that were settled round Esteco left that district in 1692 upon that town having been destroyed by an earthquake. He further says that this people consisted of five tribes: the Lule, Isistine, Toquistene, Oristene, and Tonocote. The first-mentioned four were settled around Esteco and along Rio Salado, while the fifth had lived around Concepcion, in Chaco, whence they had fled northwards, towards Pilcomayo and Yabibiri, in order to escape the Spanish oppression. The first-mentioned four tribes, who from the neighbourhood of Esteco had retired into Chaco, lived in that region until 1710, when the Lule, Isistine and Toquistene returned to the area of Spanish dominion and again submitted to the authority of the Spanish Governor at Tucuman. The fourth tribe, the Oristene, never returned from the wilds of Chaco but remained lost. Two Jesuit missions were established among the Indians, viz. Miraflores and Valbuena. They were erected approximately on the former site of Esteco. The Lule tribe were settled around the first-mentioned station, at which Machoni carried on his

work.¹⁾ It was at this place he collected the material for his book, "Arte y vocabulario de la lengua Lule y Tonocote", which was published in 1732. As will be apparent, Machoni uses the words "Lule" and "Tonocote" as synonyms of the language, and he accordingly states that it was common to all the five tribes that are here referred to.

Machoni was Superior of the Cordoba Jesuit college where LOZANO was a teacher, and LOZANO's (I) book "Descripcion chorographica del gran Chaco", which appeared in 1733, has been given a preface by Machoni. In this work Lozano confirms Machoni's statements as regards the emigration of the "Lule-Tonocote" tribe to Chaco, and he also mentions the source from which he has acquired the information concerning the emigration in question. The "Lule or Tonocote" are by LOZANO (I, p. 94) divided into two groups, viz. "Lules grandes" and "Lules pequeños". What Lozano means by these two appellations will be apparent from the following passage: "Los pequeños son los que propriamente mantienen en su parcialidad el nombre Lules, porque los grandes se buelven á dividir en otras tres parcialidades de Toquistinés, Yxistinés, y Oxistinés, y los Grandes y Pequeños son entre si muy opuestos". As a general name for these Indians Lozano uses "Tonocote". Boman seems to be in some confusion as regards Lozano's data concerning these two ethnic groups, and therefore I here cite the original text.

As already mentioned, Barzana compiled a linguistic work on the Tonocote language while doing missionary work at Esteco and Santiago in 1586. This publication of his, like his work on the Cacan language has, however, disappeared. Machoni states, however, that the Lule-Tonocote language that he studied and published 1732 is identical with the

¹⁾ Even as late as about 1765, when the Lule Indians only numbered some 1300 individuals, the classification into Lule, Isistine and Toquistene prevailed (HUONDER, p. 388).

language studied by Barzana. This statement of Machoni's has been doubted by HERVAS (I: I pp. 165—171), and after him several other philologists have considered this question.

In the present paper a detailed account of the various phases of the discussion as to whether the Tonocote language studied by Barzana is identical with the Lule-Tonocote language studied by Machoni would occupy too much space and only constitute a reiteration of the material collocated by Boman. It may, however, be pointed out that LAFONE-QUEVEDO (5) has endeavoured to identify the Tonocote language studied by Barzana with the language of the Mataco Indians of our days. The Lule-Tonocote language studied by Machoni has, on the other hand, been connected with Vilela and Chunupi (BOMAN, I, vol. I, p. 53).

Boman summarizes as follows: On the open plains of the modern provinces of Salta, Tucuman and Santiago del Estero, there was at the time of the Spanish Conquest settled a very numerous Indian population, the Tonocote, who spoke a common language, known as Tonocote, which is now extinct. On that language Barzana wrote a work which is no longer in existence. In regard to the Lule Indians who lived around the Miraflores mission station, and the Lule-Tonocote language that was studied there by Machoni, it came to be doubted as early as from the beginning of the 19th century that the latter language was identical with the Tonocote language that was dealt with by Barzana. This is a question which has not yet been cleared up.

The Indians that by earlier writers have been referred to as "*Lule*" have by BOMAN (I, vol. I, p. 55) been divided into three groups, viz. the nomadic Lule Indians, the Lule Indians that were settled on Aconquija, and those Lule Indians who are supposed to be identical with the Tonocote.

NARVAEZ (pp. 148—149) states that the nomadic Lule Indians were found in the neighbourhood of the towns of Esteco and Tucuman, that is to say within the same region as the Tonocote Indians, and that, contrary to the latter,

they were nomadic and warlike. Similar information is found in BARZANA (p. LIV), who adds that, in spite of their being of the same tribe, they spoke several different dialects. They all, however, understood the Tonocote language, which was used by the missionaries that worked among them. They were stated to subsist on hunting and fishing, and doughty warriors and the Spanish conquest prevented these Lule Indians from altogether exterminating the Tonocote Indians. NARVAEZ (p. 150) also refers to Lule Indians occurring in Valle de Lerma. In the present case these warlike and nomadic Lule Indians are in some degree interesting as it is possible that by their onslaught they put an end to the culture that is represented by the La Candelarian finds that form the subject of the present treatise. To this matter I shall presently revert.

DEL TECHO (vol. I: 1, chap. XXXIX, and vol. I: 2, chap. XX) writes of a Lule tribe among whom Barzana was missionizing in 1589, and Monroy and Viana twelve years later. From Techo's account of missionary work it appears that the Lule Indians in question inhabited a mountainous district and that their proper language was Cacan, and that they also understood Quichua and Tonocote. From this it must be inferred that they carried on intercourse with Indians both of the highland in the north and the lowland in the east. Boman supposes these Lule to have been a Diaguitan tribe that he, from the topographic description of their settlement area, locates to Aconquija.

As regards the third group of the Lule Indians, these were, as we have seen, the people whose language was studied at the Miraflores mission by Machoni, who referred to it as Lule-Tonocote.

Any attempt at proving, on the basis of MACHONI's linguistic work on the Lule-Tonocote language, that this group of Indians were bearers of the La Candelarian culture must fail. It is true that Machoni's vocabulary contains the names of several objects that are represented in La

Candelaria, as, e. g., bow and arrow, and also the words for such plants and working methods as were used by the Indians of ancient La Candelaria, as, e. g., maize, algarrobo, grinding in a mortar, grinding with muller and stone slab, but the information thus available is not of a sufficiently exact nature to allow any definite conclusions to be made. It is of more value to find, e. g., the word for sling and sling stone (MACHONI, p. 166) in the Lule-Tonocote language. More valuable and exact are the data as regards the Lule-Tonocote Indians that LOZANO (I, p. 94 and foll.) gives in his «*Descripcion chorografica . . . del gran Chaco.*» If we may believe his description of the Indians just referred to, they were culturally considerably more closely related to the Chaco tribes than to the Diaguita people. On that point LOZANO (I, pp. 103—104) says that they are nomads and live in simple huts built of brushwood. In mourning they wear their hair cut short, as do the Pilcomayo Indians of our days (KARSTEN, 2, p. 198; NORDENSKIÖLD, 18, pp. 108, 219, 253, 310; RYDÉN, 3, p. 127). LOZANO (I, p. 97) describes how among the Lule-Tonocote Indians a medicine-man cures illness by sucking the affected part. He relates how the medicine-man after having sucked the part spits out a «*flecha*» which, prior to the operation, he has had hidden in his mouth. This object is the cause of the illness, which he has now removed from the ailing part of the body by suction. A similar procedure has been observed among modern Chaco Indians (KARSTEN, 2, p. 134; NORDENSKIÖLD, 18, pp. 103—104; RYDÉN, 3, pp. 96—98). According to LOZANO (I, p. 99), the Lule-Tonocote Indians buried the new-born child along with its mother in cases where the latter died. The same thing is mentioned by GRUBB (p. 172) from the Lengua Indians of the Paraguayan Chaco. To end up with, the Lule-Tonocote Indians practised a dance at which a rattle made of deers' hoofs played an important part (LOZANO, I, p. 102). This dance was no doubt a parallel to the girls' initiation dance among, e. g., the Choroti Indians of our days (KARSTEN, 2,

p. 83; cf. also the collocation complied by IZIKOWITZ [p. 37 and foll.]). Among the Lule-Tonocote Indians agriculture played an exceedingly subordinate part, according to LOZANO (I, p. 102). On this point he says: »Hacen sus cortas sementeras de maiz, calabazas, y legumbres, con que se sustentan hasta que acaba, que es muy en breve; despues se mantienen de la miel, que sacan de los arboles.» About the same is said of the Tonocote Indians, mentioned by NARVAEZ (p. 144). Of particular interest is LOZANO'S (I, p. 104) description of the mode of burial. »En muriendo, la primera diligencia es quemar todo lo que servia al uso del difunto, y era combustible hasta el rancho de paja, que lo que no es, como ollas, y cantaros, al punto lo quiebran. Si el que muere es parvulo, no queman la redecilla, en que lo solia cargar su madre, ni qualquier otro juguete, que servia al niño; pero se lo dán gratis á otra India, por no conservar cosa alguna, que con su vista les recuerde la memoria del hijito. El modo de amortajar los cadavers es liarlos en postura de sentados de fuerte, que atan las cabezas con las rodillas, y en esta forma los cargan en una red, y llevan lexos á algun bosque donde cavan una fossa de suficiente profundidad, y en ella le sepultan.» As will be apparent, no mention is made of burial within clay vessels, and thus it may safely be inferred that the Lule-Tonocote Indians of Machoni and Lozano were, at the time when these two missionaries wrote down their notes, unacquainted with that mode of burial. It must however be borne in mind that, at the time when Lozano wrote his book and Machoni compiled his vocabulary, the Indians had already for about a generation been under European influence, besides having behind them the above-mentioned sojourn in the Chaco, both factors that already at the time when Machoni was engaged in his work must have contributed to the disappearance of a great deal of their pre-Columbian culture. A custom like that of urn-burial may, it is true, conceivably have had time to fall into disuetude

among the Indians owing to missionary influence, but seeing that not even in the earliest literature on this particular region — I refer to the brief reports compiled by Cabrera, Narvaez, Pacheco and Barzana of the time immediately following upon the Spanish conquest — any reference to urn-burial is found, the burial custom in question most probably not existed among the Lule-Tonocote Indians prior to their emigration for the Chaco. Nor do these reports, written shortly after the Conquest, give sufficiently detailed descriptions of the Tonocote Indians' mode of life to enable us to determine from them whether the Lule-Tonocote Indians of Barzana, Machoni and Lozano possessed similar cultures. In case these peoples were identical — which for the present purpose I will assume — and if they were carriers of the La Candelarian culture, then they must have practised urn-burial in pre-Spanish times. Already upon the arrival of the Spaniards the custom had with all certainty ceased to exist, and a mode of life been adopted more in accordance with that of the Chaco tribes. Nor is it probable that, during their brief sojourn in the Chaco, the Lule-Tonocote Indians had time to change from an agricultural people — like that which sustained the La Candelarian culture — into nomads who were hunters and gleaners, or that they, in that brief space of time, would also have adopted from the Chaco tribes all the known customs of the latter that Lozano enumerates.

As mentioned above, MACHONI (p. 31) states that his Lule-Tonocote, and Barzana's Tonocote, are one and the same people, and that the group of «his» Lule-Tonocote that were known as Tonocote, who were settled around Concepcion, subsequently to Barzana having worked as a missionary among them, emigrated to the district around the rivers Yabibiri and Pilcomayo. The reason for this migration is, we are informed, to be looked for in quarrels with the Spanish colonists. The Yabibiri is a small river in the Paraguayan Chaco, to the north of Pilcomayo. It runs

parallel to the latter, and in our days goes by the name of Rio Sieve. In case it may be supposed that these Tonocote Indians of Machoni were the carriers of the La Candelarian culture, it is conceivable that archaeological finds similar to those which are here dealt with might be made in the region to which the Tonocote migrated. This section of the Chaco is however still, from an archaeological point of view, a piece of unexplored ground. The only finds I know of from that area consist of a few pottery fragments of which no details are given, and a sepulchral urn which was discovered and excavated by the English missionary, ANDREW PRIDE (p. 28 and foll.), at the Makthlawaiya mission station, 100 km. east of Concepcion, and near Rio Sieve. The diameter of the urn was 114 cm., and the ware had a thickness of 4 cm. The vessel was very nearly ovoid, and no doubt of Guarani origin, because it was provided with finger-impressed ornamentation ("corrugated ware"). Further, it is mentioned by GRUBB (p. 73) that in the district occupied by the Lengua Indians he came upon ancient pottery fragments. These fragments were provided with finger-impressed ornaments, and they, too, must therefore be considered as probably being of Guarani origin. The Lengua Indians proved themselves to be ignorant of the manufacturers of the vessels in question by declaring that the finger-impressions were the work of spirits. MAX SCHMIDT (3) has recently carried out extensive exploration of the ancient dwelling-sites at Ipané, immediately east of Asuncion. The finds that were there made by him must be ascribed to the Guarani Indians. One of these finds, however, differs from the rest. It is described as follows (SCHMIDT, 3, p. 90): »Hay que mencionar aún la vasija (SCHMIDT, 3, pl. IV, I. B. 65), cuya calidad se diferencia completamente de todas las otras, así es que, desde un principio, debemos poner en duda, si elle pertenece a la misma cultura o si no sea tal vez más moderna. La vasija con pared muy gruesa (grosor de la pared 1,8 cm.) tiene en el medio del fondo una abertura esférica de un diámetro

de 2 cm. y muestra en la superficie exterior las líneas gravadas paralelas que hemos mencionado en la parte inferior de las grandes urnas funerarias. La vasija tenía seguramente algún destino especial, como en tiempos modernos, los indios usan semejantes vasijas para preparar la miel. » This object, it is true, was not discovered precisely in the region referred to above, although not so very far from it. It is the only find I know of from this neighbourhood that might be conceived as in any way connected with those from La Candelaria. Whether the hole in its bottom was intentionally made in its manufacture, or knocked out later, cannot be ascertained from the description. Schmidt further asserts that in our days vessels with a similar aperture through the bottom are used in the preparation of honey. No description of vessels of that type for the preparation of honey is known to me. — Later I shall recur to the above-mentioned migration of the Tonocote Indians to the Chaco.

In his geographic-historical review of the ancient province of Tucuman, SCHMIEDER (pp. 370—372) has especially pointed out that account must be taken of a cultural decline in the case of the settled, maize-cultivating population of northwestern Argentina at the time of the Spanish conquest and the period next following. The cause of this he considers to be onslaughts from the east on the part of the nomadic tribes of the plains. Schmieder emphasizes that the large pre-Columbian ruin complexes in Tucuman, which suggest a rich culture and a well-to-do population have not been described by any of the early Spanish conquerors. Schmieder cites OVIEDO Y VALDÉS' (vol. IV, p. 263—265) statement that, on his march through northwestern Argentina (in 1536), Almagro found the region from Jujuy in the north to Chicoana in the south devastated by »juries», concerning whom it is expressly stated that they were nomads. The appellation »juries» must therefore refer to such Indians as inhabited the region immediately south of the Andes, i. e. the nomadic Lule Indians. As BOMAN (vol. I, p. 41

and foll.) has shown, »juries» otherwise is the name by which are known, not any particular tribe, but the Indian tribes, generally, that inhabited the ancient province of Tucuman. Schmieder adduces additional evidence of a cultural change having taken place in parts at least of the valleys of Tucuman before the coming of the Spaniards, and that the nomadic Indians of the plains next to the Andes by their inroads had devastated the cultivations and the settlements of the adjacent valleys of the highland. The exact degree of the destruction wrought by the invaders is however impossible to determine. As to this, TEN KATE (p. 5) maintains that thereby the entire province had been laid waste prior to the arrival of the Spaniards. SCHMIEDER (p. 372) further cites the result of an enquiry which the Procurador of the Cabildo of Santiago del Estero made in 1585 among those burghers of the town who were eye-witnesses of the conquest, and which gives a most illuminating description of the situation (LEVILLIER 2, vol. I, p. 116): »Los lules que es vna gente saltedora e beliciosa no la acauasen e destruyesen porque los tenian acorralados e metidos en pucaranes y fuertes quitandoles y talandoles las heredades y chacaras que tenian de mayz quinva e capallo que es el principal sustento que tenian porque los dichos lules no bibian otra cosa sino de robar hurtar e matar e no senbraban comiendoles quanto tenian que son figurados los alarues e si los dichos conquistadores los dexaran obieran destruido acabado y asolado los dichos naturales que solamente por esto hicieron gran servicio a dios nuestro señory a su magestad . . . » The same thing is also mentioned in other places in the reports that LEVILLIER (2, vol. I, p. 154 and pp. 236—237) has published. I have in the foregoing mentioned how in ancient dwelling-sites in La Candelaria are to be found large numbers of stone celts, as well as intact clay vessels, and that this circumstance points to the dwelling-sites having been suddenly abandoned. It may therefore well be supposed that they were deserted just

because of attacks from the nomadic Lule Indians of the more low-lying country. It may however be noted that neither in La Candelaria nor in Pampa Grande are there to be seen any fortificatory stone constructions resembling those found in the neighbouring Andine region, and in the case of the La Candelarian dwelling-sites it is not very often that the situation in itself possesses any particular defensive value. This does not, however, exclude the possibility of fortified dwelling-sites having existed. The villages may have been surrounded by palisades consisting of spiny cactuses and shrubs, a system of fortification of which quite naturally no trace can have survived into our time. Fortifications of this type are in fact mentioned in the earliest literature (CABRERA, p. 141). OUTES (3, p. 13), too, has expressly referred to a cultural decline as regards the population of northwestern Argentina of this time.

Also from the west, however, attacks were brought to bear on the La Candelaria region — in which in this connection I include Pampa Grande. As I have already mentioned, the Diaguitan finds in Pampa Grande point to an invasion from the west. Whether this invasion was of a peaceful or warlike character cannot be determined. It must, however, as has also been pointed out in the foregoing, be dated to some pre-Incan period. But even from the era following the Spanish conquest there are records of invasions from the same quarter. In this connection NARVAEZ (p. 148) mentions that the Calchaqui Indians made attacks on the district east of Aconquija and Cumbres de Calchaqui. Also at a later date, in connection with the great Calchaqui rebellion, the region in question was attacked from the west. The governor of the province of Tucuman, Don Filipe de Albornoz, in a report dated March 1, 1633, gives an account of these attacks (DOCUMENTOS . . . , vol. I, pp. 91—92). Boman has moreover also published this letter some years before it appeared in Documentos del Archivo de Indias (BOMAN, 10, pp. 17—42). The report in question relates

how the Calchaqui Indians on several occasions passed Aconquija and invaded «el valle de Choromoros», that is to say, it was the district immediately southwest of La Candelaria that was exposed to their attack. Albornoz further says: «En la ciudad de Salta no se estaba con menos cuidado por la vecindad y cercanía del dicho valle de Calchaquí, que en la Pampa Grande y Guachipas, términos de aquella ciudad, hicieron algunos daños con muerte de tres españoles, a cuyo amparo se recogieron los pueblos porlares, chicuanas y otros hasta en número de ochocientos, que con sus familias se salieron huyendo del dicho valle y se vinieron a poblar al valle de Salta porque el enemigo no los obligase por fuerza a confederarse con ellos . . . » Both the «porlares» (Pulares) and the Chicuana Indians were, judging by the available evidence, Diaguitan tribes (BOMAN, I, vol. I, p. 22; 10, p. 9). Either of these Diaguitan groups may conceivably have been inheritors of the Diaguitan culture that in Pampa Grande has been found to have superseded the La Candelarian culture. If such be the case is, however, not quite clear from Albornoz report. The Diaguitan groups just referred to are stated to have been friendly to the Spaniards, and to have constituted particularly valuable allies in the defence of Jujuy and Esteco (DOCUMENTOS . . . , vol. I, p. 92), nor did they in fact side with their kinsmen in the rebellion.

Especially the region situated immediately southwest of La Candelaria, and south of Pampa Grande, i. e. the region containing the present communities of Ruiz de los Llanos and Trancas, in the Rio Salis valley, are likely to have been especially exposed to attacks from the rebellious Indians. Immediate to the west of that region there is, it may be noted, a mountain pass, Cuesta de Trancas, or Choromoros, where it is possible without any greater difficulty to cross Cumbres de Calchaqui (AMBROSETTI, 4, pp. 16—17). This pass evidently was of great importance during the rebellion, as its name frequently occurs in the reports that

have been published in DOCUMENTOS DEL ARCHIVO DE INDIAS PARA LA HISTORIA DEL TUCUMAN (vol. I, pp. 155, 272, 282, etc.). In Pampa Grande, as already mentioned, numerous finds of Diaguitan character have been made. In La Candelaria they are so far limited to a single find from Santa Barbara. Those Diaguita Indians who have left these traces of their existence east of Cumbres de Calchaqui no doubt entered by the same route as their descendants during their wars with the Spaniards in the 17th century.

In none of the authorities that have been cited above are any decisive proofs to be found that either the Tonocote Indians referred to by Barzana and his contemporaries, or the Lule-Tonocote Indians referred to by Machoni and Lozano were the carriers of the La Candelarian culture, or identical peoples. If these tribes were identical, then the Indians that at the time of the Conquest inhabited the region at the foot of the Andes where in our days finds are made resembling those from La Candelaria and Pampa Grande must have possessed a culture more nearly approaching that of the modern Chaco tribes — e. g. the Indians on the Pilcomayo — than that of the bearers of the La Candelarian culture and the Diaguita Indians. The civilization represented by the finds here dealt with must consequently, so far as can be judged, have ceased to exist at the time of the Spanish Conquest. It was probably wiped out by hostile incursion on the part of nomadic Indian tribes of the plains, but even attacks by Diaguitan Indians may conceivably have brought about the same result, or at any rate have contributed to its disappearance. It is however possible that Hervas is correct in his statement that Barzana's Tonocote Indians and Machoni's Lule-Tonocote are two different tribes, and that the former were the carriers of the La Candelarian culture. At the time of the Spanish conquest the Indians referred to by Barzana as »Tonocote» were on the way to being exterminated at the time of the Spanish conquest (BARZANA, p. LIV), and the

agricultural population that in the report published by LEVILLIER (2, vol. I, p. 116) is stated to have been exposed to violent raiding by Lule Indians may therefore possibly have consisted of Tonocote Indians. That the Tonocote Indians were an important tribe is evident from the fact that at the Spanish conquest their language was a sort of «lengua general» in this part of Argentina (BARZANA, p. LIV; DEL TECHO, vol. I: 1, chap. XXXIX, and vol. I: 2, chap. XX; also cf. BOMAN I, vol. I, pp. 55—57). As regards urn-burial, they would however seem to have given up this already at this period seeing that no reference is made to it, and it is possible that this change was due to a cultural decline caused by the Lule Indian hostile invasion. If Machoni is correct in his statement that these Indians migrated to the tracts about the rivers Pilcomayo and Yabibiri, it may well happen that by and by finds resembling those of La Candelaria will be made there unless the tribe in question already prior to its emigration had been entirely decultured through the Lule aggression. I have in the foregoing touched upon this question.

The causes which in the foregoing have been set forth as having led to the downfall of the La Candelarian civilization were of a more political nature: warlike involvements being supposed to have broken up the said culture. SCHMIEDER (p. 372) has however advanced another theory, viz. a sudden deterioration of climatological conditions. LOZANO (2, vol. IV, p. 25 and foll.) in fact relates that immediately before the Spanish conquest of northwestern Argentina a protracted and exceptionally severe drought is said to have compelled a proportion of the Indians then inhabiting that part of the country to emigrate to the Chaco. Schmieder points out that the great wealth of archaeological finds in northwestern Argentina, in conjunction with the extensive dwelling-sites, must be taken as evidence of a very numerous population. Maize-growing, partly based on irrigation, constituted the element on which their culture was founded,

and it seems probable that the productive capability of the ground had to be used to the utmost. A year or two of severe drought may have sufficed to cause a famine of catastrophic proportions, thus bringing about a cultural crisis compelling the people to emigrate and laying them open to attacks by invaders from the plains. It is conceivable that similar conditions occasioned the breaking-up of the La Candelarian culture.

The ancient civilization of La Candelaria belonged to an agricultural population, to which the cultivation of maize was of fundamental importance. For this reason the La Candelarian, as also the Diaguitan, culture must be referred to the Andine culture area — the »Peruvian culture sphere«, as it has been called by SCHMIEDER (p. 363). Of irrigation works there are, however, no trace in La Candelaria, by reason of their not having been necessitated by physiological conditions. The ceramic finds from La Candelaria, both in regard to form and ornamental details, emphasize the above-mentioned connection with the highland in the west, and the close relation to the Diaguitan culture is especially obvious. There is such a rich variety of form that it seems one has to turn to some Peruvian archaeological area, e. g. the Nasca district, in order to find a parallel to the La Candelarian finds. The absence of vessels with three or feet, or with an annular foot, is remarkable. A suggestion of feet is however discernible on the vessel in fig. 93, *b*, and the concave bottom may, in its turn, constitute incipient annular foot. Occasional details in La Candelarian ceramics recur in modern Chaco Indian pottery, and on similar grounds it is possible to trace intercourse between La Candelaria and the East-Andine region of Bolivia (the Mizque Valley). Especially in view of the mollusc finds it is reasonable to suppose that intercourse existed between the La Candelarian culture and the population of the Atlantic coast of South America, as well as possibly also with the inhabitants of the Pacific coast of the continent.

From what has been adduced above it does not appear conceivable that any Guarani people were the bearers of the La Candelarian culture. As regards the theory that this culture was sustained by Lule-Tonocote Indians it must in the first place be pointed out that so far as our knowledge goes it is not possible to decide whether the Tonocote Indians that are referred to in the earliest literature (Barzana, Cabrera, Narvaez, Pacheco) are identical with the Lule-Tonocote Indians mentioned by writers of the 18th century (Lozano, Machoni). Sporadic items of information contained in the earliest literature fit in, it is true, with archaeological conditions in La Candelaria, but on the other hand the literature in question gives no data precluding the supposition that the two peoples were actually the same, and possessed the same culture, that is to say a people of hunters and gleaners, in contradistinction to the agricultural people that must be supposed to have sustained the La Candelarian civilization. The absence of Incan ceramics in Pampa Grande and La Candelaria is hardly explainable by arguing that the archaeological sites lay beyond the region influenced by Incan civilization. I am on the contrary of opinion that the Diaguitan finds of Pampa Grande are older than Incan influence in northwestern Argentina, and from this it follows that the La Candelarian archaeological finds here dealt with, as well as corresponding finds from Pampa Grande, must be supposed to possess greater antiquity than the Diaguitan finds in question. That during some period of time the two cultures were in contact with each other, and that they existed side by side, I have already pointed out in the foregoing (p. 119 and p. 273).

XI.

Modern native pottery-making in La Candelaria.

During my stay in La Candelaria I was told of two mestizo women who knew how to make pottery without the help of the wheel. One of these women has manufactured the two vessels seen in fig. 140, *a—b*, and I personally saw her making vessel *a*. As her handicraft without a doubt is founded on traditions from the Indian era, I give below a description of her working method. Unfortunately the woman was affected by a physical defect which made it impossible to elicit, by questioning, any information beyond what appears below.

The material consists of clay obtained from the bed of the river, and then mixed with powdered rock, probably some kind of mica-schist. In the process of manufacture there is used, apart from the potter's hands, nothing but a wooden splinter about 10 cm. in length (fig. 140, *c*) and a piece of gourd shell, in this case consisting of one half of a discarded bombilla, for the serving of maté. These implements, as well as the hands, were all the time kept well moistened.

On a wooden board was placed a lump of clay, which was kneaded until it had assumed the shape seen in fig. 140, *c*, while being at the same time firmly pressed down on the underlay. Before work was commenced, as also during its progress, the mass of clay was carefully cleaned from any too large particles of the crushed rock that had been admixed to it. All of the bottom portion of the vessel was modelled into shape by hand, in the manner seen in fig. 139, *a*. At this juncture, as also at a later stage, the bottom portion

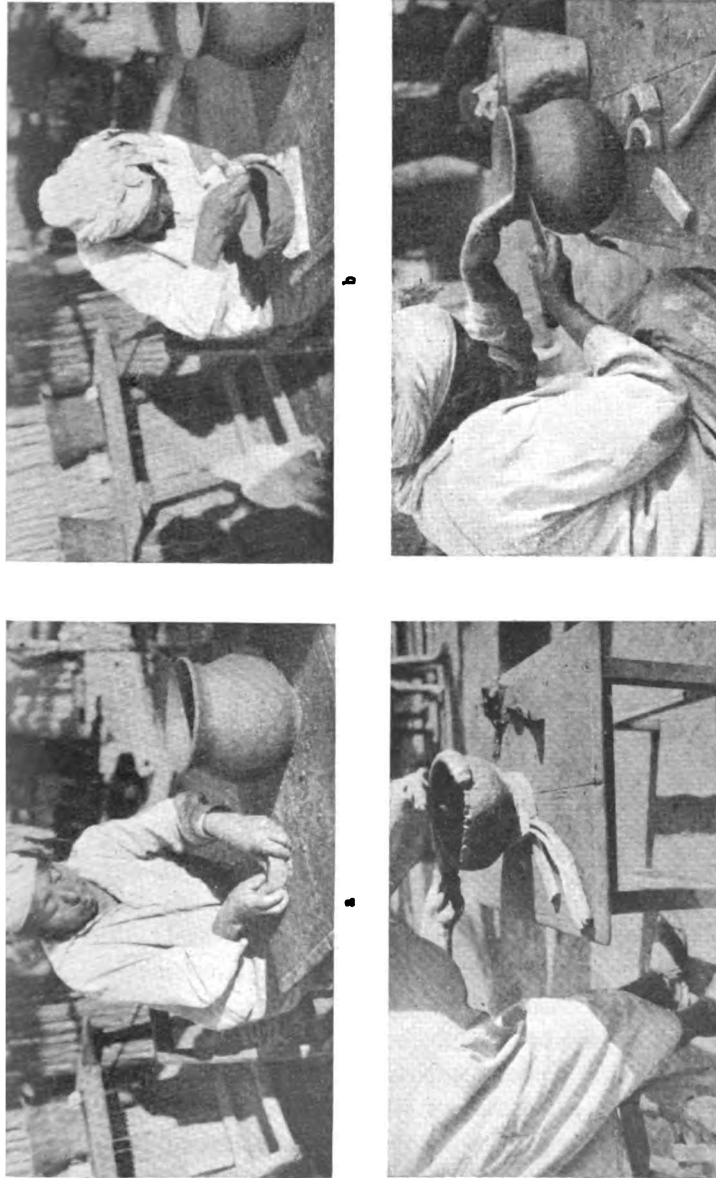


Fig. 139. Modern pottery-making methods in La Candelaria. a. Shaping the bottom portion. To the right a nearly finished clay vessel of the same type as that which is being manufactured. b. Smoothing the interior of the bottom section. c. The bottom section is here finished, its edge is pinched to evenness, and the first length of the roll that is to constitute the belly is affixed to it. The second section of the clay roll is lying ready on the table. Note the groove in the upper side of the roll into which the edge of the completed bottom portion is to be fitted. d. The places where the handles are to be attached are scored with the point of a knife. The two handles are seen on the table.

was smoothed with the gourd shell, and the outer wall with the wooden stick, while the other hand supported the vessel portion, as seen in fig. 139, *b*. Then the projection that had been left in the centre of the vessel during its shaping was removed. In two archaeological bottom fragments, one from the Comechingon district (GARDNER, fig. 3, *a*), and the other from Balde de Azcurra, in St. Luis (OUTES,

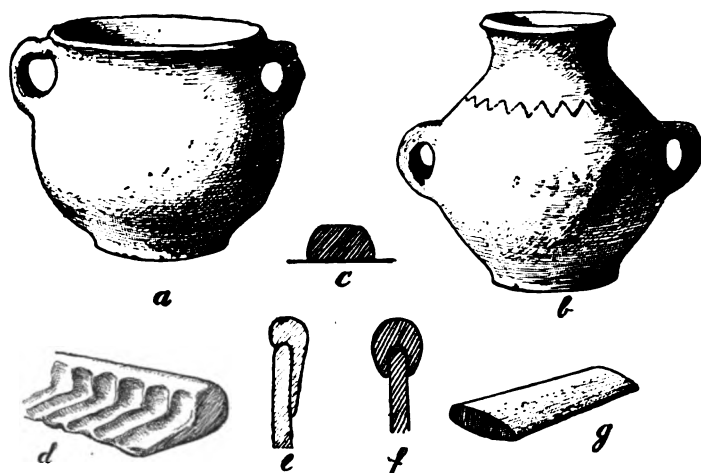


Fig. 140. *a*—*b*. Two modern clay vessels from La Candelaria, (G.M. 33.1.784—785). *c*. The shape of the clay mass prior to its being formed into the bottom portions of the vessel, *d*. Clay roll ready for attaching to the edge of the vessel that is being built up, *e*—*f*. Different methods of affixing clay rolls to the edge of a vessel in the course of its manufacture. The outer side of the vessel is to the right, *g*. Wooden stick used in pottery-making. *a* and *b* scale $\frac{1}{4}$.

1, fig. 11), this projection is left in the fired vessel, which shows that they were manufactured by the same method. The edge of the finally shaped bottom portion was then smoothed and at the same time levelled all round by using the thumb and first finger for pinching small notches out of the edge, fig. 139, *c*. A roll of clay was then formed, and with the sharp edge of the wooden stick a longitudinally running groove was made in it. A similar shape is besides

given to the clay rolls by the Karaja women (KRAUSE, p. 68). The clay roll was applied to the bottom portion in two operations, and in such a way that the edge of the bottom portion was fitted into the groove in the roll, fig. 140, *f*. In fig. 139, *c*, is seen how part of the clay roll has been placed on the top of the bottom portion while the remainder of it lies ready to be fitted over the other half of the edge of the bottom portion. While the potter with her right hand and the wooden stick worked the clay roll until the vessel attained the height where the neck was to begin, she supported the inner side of the wall with her left hand. The piece of calabash was then used for smoothing the inner side of the vessel, and the edge was evened in the way already described. Another roll of clay was then made. Before being applied to the vessel it was given the shape seen in fig. 140, *d*. The shallow grooves seen in the edge of the roll were produced by repeatedly pressing the tips of the first and second fingers against its edge. The roll was placed on the edge of the vessel in the way seen in fig. 140, *e*. From this roll of clay the neck and the rim of the mouth was shaped. She then took a knife and cut another clay roll into two equal lengths. These were to be formed into handles, and were bent into suitable shape. With the point of a knife a number of linear incisions were made in the four places where the handles were to be attached to the wall of the vessel. For the top part of the handle the incisions were horizontal, while for the lower end they were criss-crossed. Thereupon the handles were stuck on, the joints where they were attached were closed up with a morsel of clay, and the small hump on the upper side of the handle was modelled into shape. In case it was necessary to interrupt the work, the edge of the vessel was smoothed down from all unevenness, and then covered with a damp rag. When the work was resumed, the edge was first examined for cracks from drying, whereupon a fresh roll of clay was laid without the edge having first been ser-

rated by nipping with the thumb and forefinger in the way described above. After having been set to dry for a day or so, the vessel was ready for firing. Unfortunately I was never given an opportunity of witnessing that procedure, but a La Candelarian friend of mine, Commissioner JULIO ECHENIQUE, very kindly went to see how it was done, so that he could describe it to me in a letter.

First, a hole is dug in the ground, its depth and with dependent upon the size of the vessel. For the firing of the vessel seen in fig. 140, *a*, the pit was given a diameter of 40 cm. Its bottom was covered with dry cattle dung, and upon this the vessel was placed and covered over with the same kind of fuel which was then lighted. The fire was kept up for about four hours, at the end of which the firing was complete, and the vessel taken out and left to cool down slowly.

NORDENSKIÖLD (II, pp. 16—17) mentions that the Quichua Indians use dry llama or cattle dung for fuel in pottery-firing, and BOMAN (I, vol. II, p. 480) says that at Cobres he observed Atacama Indians using the same sort of fuel when firing their clay vessels. He also points out that the same applies to the Zuñi Indians of North America (STEVENSON, p. 376). The reason for the use of fuel of this kind is no doubt to seek in the entire absence of wood. This deficiency is especially noticeable in the Andine highland, where as a substitute dry cattle or llama dung is almost exclusively used. In ancient La Candelaria, ordinary fuel was available while llamas were absent, and for that reason there may arise the question whether the method of firing pottery with animal dung was not imported from the highlands only after cattle had been obtained from the whites. In this connection may also be mentioned the pits in the ground that OUTES (I, p. 295 and foll.) discovered in the province of San Luis. The pits in question were egg-shaped. They often contained particles of some charred substance and as

the walls were hardened by fire he considers that these pits must have been used as fireplaces for some specific purpose. Thus he connects them with pottery-making. The present-day inhabitants, it may be noted, generally fire their clay vessels in pits, and in the process use cattle dung. GRESLEBIN (2), too, has studied these so-called »botijas», or »tinajas», in the province of San Luis. He believes that no acceptable explanation of these finds has yet been found. He holds that they cannot have been pits in which clay vessels were fired, nor even designed for collecting rain water. The ashes contained in these pits being devoid of skeletal remains, it is also out of the question that the ashes from cremated dead were interred in these pits. FRENGUELLI and APARICIO (pp. 138—147) have in connection with a number of similar finds made by them in the province of Cordoba, after Greslebin, reopened the question as to the purpose served by these »botijas». Unlike Greslebin, the authors just referred to are convinced that the said »botijas» constituted pits for firing clay vessels.

Concerning the second vessel, fig. 140, *b*, made by the woman referred to above, it should be pointed out that it presents an ornamental design which is identical with that found on the archaeological vessels, of La Candelaria, viz. the zigzag line.

In this connection attention should be drawn to APARICIO's (6) excellent report on modern pottery among mestizos in the highlands of the province of Cordoba. From this we find that the manufacturing method there used is practically identical with the one described above from La Candelaria. Even as regards shape, correspondence is to be found between those modern ceramics from Cordoba and the La Candelarian finds. As an example of this, APARICIO (6, pl. I, *b*) illustrates a modern clay vessel with a handle, which is regarded as a degenerate form of the vessels seen in fig. 86, *c* and *g*. It may of course be objected that this type

may have been introduced by the Europeans, but the method of affixing the handle — its upper end being fastened to the rim and inner side of the vessel, the lower end being inserted into a hole made through the wall — argues in favour of this Cordoban vessel type being an inheritance from pre-Columbian times.



Fig. 141. Maize barn built on piles. Unquillo, La Candelaria.

XII.

Modern La Candelarian native grain stores.

In conclusion I wish to devote a few words to the sparsely occurring, pile-supported receptacles that present-day La Candelarians use for storing maize. A grain store of this kind is illustrated in fig. 141, and the details of its construction will be apparent from fig. 142. On four posts, about one meter in height and forked at the top, two strong beams are placed. These beams serve to support the floor of the "barn", the flooring consisting of sticks placed close together. Over the floor a covering of grass is laid in order to prevent maize cobs from falling down between the sticks. The floor measures about 4×4 metres. In each of the four corners

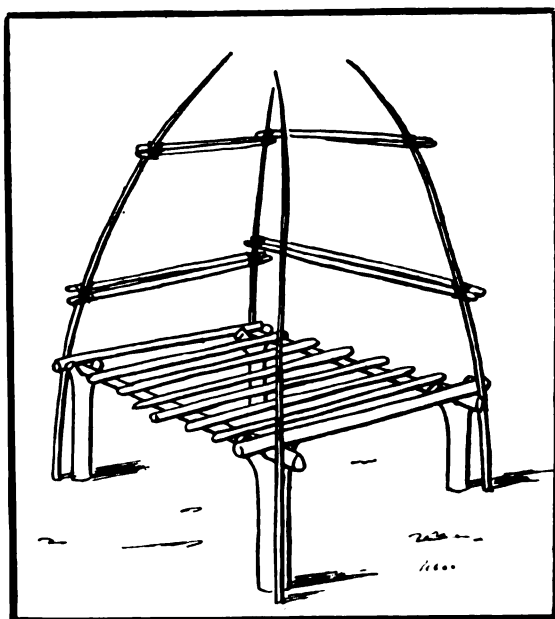


Fig. 142. The maize barn on fig. 127. The grass walls have been completely removed. On two of the walls the sticks between which the grass wall is wedged in are left.

is fastened a thin and pliant pole, and the top ends of the four poles are made to meet in a point directly above the centre of the floor by securing them, two and two, to sticks, in the way seen in the illustration (fig. 142). Between the sticks is then wedged in a layer grass, maize stalks, brushwood, etc., so as to form a wall. In storing the maize, the cobs are neatly stacked inside the structure.

NORDENSKIÖLD (8, p. 3 and foll.) has studied the occurrence of pile-built dwelling houses in South America. From his map will be seen that houses constructed on poles are found along the northern coast down to the estuary region of the Amazon river, in the Roroima district, along the northern part of the western coast down to the northern border of Peru, as well as sporadically along the eastern

slopes of the Andes. It is worth noting that it is only when Mojos is reached that, in addition to dwelling houses, also the grain stores are pile-built. The southernmost instances of pile-built grain stores are found among the Chiriguano, Chané, Mataco-Vejos, and Mataco-Guisnay tribes. For my own part I have observed yet another Chaco tribe with pile-built grain stores, viz. the eastern group of the Toba tribe, of the province of Formosa, in Argentina. The grain store possessed by these Indians differs from the one illustrated in fig. 142 in so far as in this case for the long sticks tall and forked posts supporting the two roof beams have been substituted which in their turn carry the roof itself. The roof proper consists of a layer of grass, covered with earth, as a protection against the rain. One pair of the main poles is longer than the other, so that there is a pitch in the roof to ensure a speedy running-off of the rain-water.

APPENDIX I.

J. Vilh. Hultkrantz:

A brief report on an examination made of certain human skeletal remains collected in 1932 in the La Candelaria Department of the Province of Salta, Argentina, by S. Rydén, of the Gothenburg Museum.

I. Male skull (G.M.33.15.698). See p. 83.

The skull is in a good state of preservation except for the dexter mandibular condyle being broken, and the nasal bones slightly damaged. Its strong structure with well developed processes for muscular attachment, and superciliary ridges, lend it a markedly *masculine* character. The sutures — in particular the lambdoid and coronal — are partly obliterated to the extent of degrees 2 and 3 of Broca's scale. This points to an age of about 40, or over, which is not contradicted by the state of the teeth (see below).

The cranium is below medium size, and has a capacity about 1200 cc. Its shape may be most nearly described as of sphenoides latus (Sergi) type. It is strongly brachycephalic (L : B index 87.6) and hypsicephalic (L : H index 85.7). Especially striking both in profile and vertical aspect (fig. 143, *a*, and 144) is a flattening of the occiput, resulting from which the upper part of the occipital bone and the posterior medial angles of the parietal bones form a triangular, fairly plane, surface measuring about 6 × 6 cm., on which the skull can be balanced with a considerable degree of stability.¹⁾

There can be no doubt that the above-mentioned flatte-

¹⁾ It is only in exceptional cases that a normal skull can be balanced in this way.

ning has been effected through intentional deformation during early infancy, either by direct pressure against the underlay in the cradle, or by application of some special »skull-press«, of wood, of the type described by Imbelloni, Aichel, and others¹⁾. The shape of the skull most nearly corresponds to the »deformacion tabular eretta« mentioned by the former author.



Fig. 143. Skull from El Molino(?), La Candelaria.

As will be apparent from fig. 144, in the present case the pressure applied to the back of the head has not acted symmetrically but caused a stronger shortening of the right-hand half of the skull than of the left, the tuber parietale on the right-hand side appearing to have been displaced some mil-

¹⁾ IMBELLONI, J.: Die Arten der künstlichen Schädeldeformation. *Anthropos*, Band XXV, 1930.

— — Über Formen, Wesen u. Methodik der absichtlichen Deformationen. *Zeitschr. f. Morphol. u. Anthrop.* Bd. XXXII, 1934.

AICHEL, O.: Ergebnisse einer Forschungsreise nach Chile, Bolivien. 2. Die künstliche Schädeldeformation. *Zeitschr. f. Morphol. u. Anthropol.* Bd. XXXI, 1933.

limetres forward. The comparatively narrow and somewhat sloping forehead, on the other hand, presents no corresponding frontal pressure area. No groove-shaped depressions that might suggest marks from tight bandages, or the like («deformacion circunferencial», IMBELLONI), are discernible on the skull.

The auditory meatuses are fairly small, but present no exostoses such as otherwise are not infrequently found in South American skulls.

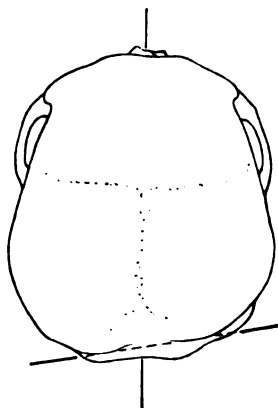


Fig. 144. Diagram of the skull fig. 143.

The skeletal system of the face (see fig. 143) is of extended length (Index, according to Kollmann, 92.7), symmetrical, has moderately projecting superciliary ridges, somewhat out-turned jaw-angles, while the chin portion is high and broad. The orbits are average-sized, and mesoconchal (Index 77.8). The nose is comparatively narrow (Nasal index 47.5). The facial profile (see fig. 143, a) is on the whole fairly

straight, orthognathous, with out-curving nasal ridge. Alveolar processes and teeth are set in a fairly vertical position.

Of the *teeth* in this skull, all the molars as well as the 2nd premolar of the right upper jaw were lost already in life. The corresponding portions of the alveolar processes have been entirely resorbed; traces of the alveoli of the middle molars are however discernible in the upper jaw. The portions of the lower jaw where the molars once were situated are fairly massive, but contain no unerupted teeth, as was ascertained by the part being X-rayed. — Of the teeth, 19 in number, that were in situ at the time of death, all the incisors and the 1st premolars of the upper jaw, as well as both incisors of the left lower jaw, have subsequently dropped out. The remaining teeth are much worn

and present hollowed-out masticating surfaces. Round the root of the left canine of the upper jaw appears a distinct cavity, apparently caused by chronic periodontitis (granuloma) (cf. fig. 143, *b*, the cavity marked with *); also round the root of the medial incisor of that jaw the alveolus appears diseasedly enlarged. On the outer side the alveolar processes are strongly atrophied, so that the necks and roots of especially the incisors are largely laid bare in the way frequently seen in *Pyorrhea alveolaris*.



Fig. 145. Skull from El Paso de los Antiguos, La Candelaria. Photograph taken immediately after excavation.

II. Female skull, and fragments of appartenant skeleton, from El Paso de los Antiguos (G.M.33.5.735). See p. 44.

This skeleton is in an advanced state of decay, and very fragile. To begin with the skull, from fig. 145 it can be seen that at the time of its discovery its different parts were still adhering together, but a closer examination plainly reveals that it has been exposed to exterior pressure, and probably also to changes of humidity, through the agencies of which it has been deformed and in certain places cracked or ruptured in the sutures. The prognathous shape of the jaws that so markedly appears in the

illustration is undoubtedly the result of «posthumous deformation». — When the skull was subsequently cleaned, the fragments to some extent fell apart, and, owing to minor alterations of shape, it is now impossible to fit them together with an exactness allowing wholly reliable measurements to be taken. This applies especially to the base of the skull and its connections with the facial bones, while the brain-pan proper has better retained its original shape.



Fig. 146. Skull from El Paso de los Antiguos. (See also fig. 145).

This skull, which is on the whole of a slender formation, with slightly developed processes for the attachments of muscles, and superciliary arches, may with great certainty be determined as having belonged to a woman. Having regard to the fact that only the anterior portion of the sagittal suture presents incipient obliteration, while on the other hand the molars that remain in the lower jaw are fairly worn — although their opposites of the upper jaw with all certainty have disappeared some considerable time before death (see below), the age of this individual may be set down as 30 years or there about.

The skull is strongly brachycephalic; its breadth exceeds its length by a couple of millimetres (Index about 102). This

rather unusual shape may perhaps to some extent be due to posthumous deformation, but the considerable flattening of the occiput (cf. fig. 147) very definitely indicates that the shortening of the skull and its increased breadth *mainly* are ascribable to an intentional deformation of the skull during early infancy. In this case pressure appears to have been applied more exactly in the longitudinal direction of the skull than was done with the male skull described above.

In comparison with the capacious brain-pan the facial portion appears small. The fairly low facial index (about 82) is mainly due to inferior development of the jaws. The orbits are of average size (Index about 77). Nasal index is about 51, thus bordering between chamae- and mesorhincic. So far as can be judged from the bones which are somewhat

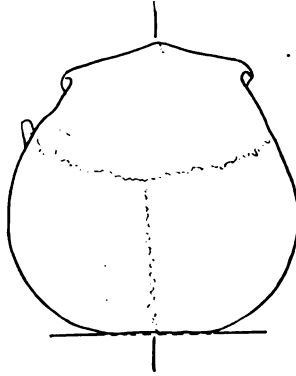


Fig. 147. Diagram of the skull fig. 145.

damaged, the nasal bones being missing, the nose must have been only slightly projecting and not deviated from the forehead to any marked extent. The profile (fig. 146, *a*) shows a very moderate prognathism of the alveolar processes of the upper jaw. The lower jaw is of fairly slender build, with a somewhat obtuse angle, and very slightly everted gonions.

The teeth were fairly well developed, and regularly disposed. In the lower jaw all the teeth were present at the time of death, but the wisdom-teeth have subsequently dropped out of their sockets. In the upper jaw, on the other hand, all the molars as well as the posterior premolars were lost during life, and their alveoli have had time for complete retrogression. — Of the remaining teeth the majority are much worn, so that the dentine has become bared in several places; the molars of the lower jaw are worn down in an especially remarkable degree.

In many parts of the dental system pathological alterations are distinctly noticeable. Especially on the outer surfaces of the alveolar processes of the jawbones traces of periodontitis can be seen. The walls of the alveoli are strongly atrophied, in consequence of which the roots of the teeth are largely bared; deposits of tartar occur in many places. The alveolus of the right medial incisor of the lower jaw is enlarged, especially on the inner side, by periapical osteitis.

Lastly, the remaining molars of the lower jaw, as well as the 2nd premolar on the right, are affected by typical caries, which has evidently spread from the necks of the teeth. On the right side the carious cavities are particularly large.

Among the *skeletal parts* that were recovered in association with the last-mentioned skull the principal ones consist of some fairly large fragments of bones of the extremities (2 of humerus, 2 of ulna, 1 of radius, 2 of femur and 1 of tibia), together with numerous fragments of the shoulder and pelvic girdles, vertebrae, ribs, metacarpal bones, etc. All of these bones are of fairly slender proportions, and may belong to one and the same individual, probably of the female sex. None of the larger extremital bones is complete enough for reliable measurements of length to be taken, but from comparisons with other skeletons, together with approximate calculations based on Manouvrier's tables, it appears that the height of the individual can be estimated at something between 150 and 160 cm.

On the fragments of femur and tibia the surface of the bone is in parts somewhat roughened, recalling deposits due to periostitis, but on account of the high state of decay it is impossible to draw definite conclusions.

III. Fragments of foetal skeleton discovered in a sepulchral urn from Huanacocha (G.M.33.15.728). See p. 104.

As can be seen from the photograph (fig. 148), which is reproduced in natural size, we have here five small pieces roughly cylindrical in shape, in section measuring 3—5 mm,



Fig. 148. Bones of a foetus in the sixth embryonic month. From grave 3, Huanacocha, La Candelaria. Scale 1/1.

and increasing in thickness towards one end. In at least three of them foramina for the nutrimental vessels can be seen, and in other places traces of muscle insertions are discernible. Here and there, where the superficial layer of bone substance has been abraded, a well developed spongy substance can be seen distinctly.

By means of Röntgen-photographing both the bone fragments in question (fig. 149) and prepared foetal skeletons from the collections of the Anatomical Institution, more exact comparisons have become possible, and the bone fragments in question have thereby been proved to correspond exceedingly well, both as regards size, shape and structure, with humeri and femurs of foetuses of the sixth embryonic month.

At the Uppsala Histological Institute (Director: Professor E. AGDUHR) two of these bone fragments — after having been embedded in celloidin and decalcified — were subjected to microscopic examination. Although certain details

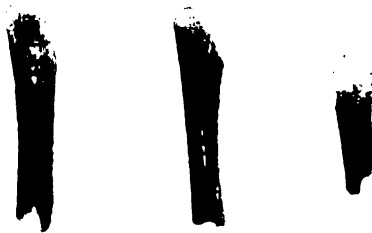


Fig. 149. Röntgen photograph of three of the bones in fig. 148.

of the structure had been destroyed through long-continued maceration, the objects in question were beyond doubt ascertained to consist of typically spongoid bone substance.

Principal measurements of the skulls.

	G.M. 33.15.698.	G.M. 33.15.735.
Maximum length (Glabella to opisthocranium)	161 mm.	149 mm.
Basal length (Nasion to basion)	99	?
Maximum breadth	141	about 151
Minimum frontal breadth	95	about 91
Basibregmatic height (Basion to bregma)	138	• 124
Horizontal circumference	486	• 480
Total longitudinal arc (Nasion to opisthion)	340	
Cranial capacity	about 1200 cm ³	about 1160 cm ³
Height of the face (<i>Kollman</i>) (Nasion to gnathion)	127 mm.	about 111 mm.
Nasoalveolar length (Nasion to prosthion)	70	• 64
Zygomatic breadth	137	• 135
Bigonial breadth of the mandible	102	105
Basialveolar length (Basion to prosthion)	100	
Orbital height	35	34
Orbital breadth	45	44
Interorbital breadth	20	19
Length of the nasal skeleton (Nasion to nasospinale)	51	about 48
Breadth of the nasal aperture	24	• 24
Cranial length: breadth Index	87.6	102.7
• length: height Index	85.7	83.2
• breadth: height Index	97.8	82.4
Upper facial Index (<i>Kollman</i>)	92.7	88.2
Orbital Index	77.8	77.3
Nasal Index	47.5	50

Uppsala in Juli, 1936, (sgd).

J. Vilh. Hultkrantz.

APPENDIX II.

Walter Kaudern:

A brief report on an examination made of certain osteological remains collected during 1932 in the La Candelaria Department of the Province Salta, Argentina, by S. Rydén, of the Gothenburg Museum.

G. M. 33.15.634, *a—b* (fig. 150), provenance Unquillo (cf. p. 127). Lower jaw, already when found, broken in two parts. Undoubtedly deriving from domesticated llama (*Lama lama*), seeing that *ramus ascendens mandibularis* forms an almost right angle with *corpus mandibularis*.

G. M. 33.15.516 (fig. 136, *c*), provenance Sta. Lucia (cf. p. 121 and pp. 264—265). Fragment of a lower jaw (the angular portion). Probably of guanaco (*Lama huanacus*, Molina) seeing that the angle between *ramus ascendens* and *corpus mandibularis* is markedly obtuse.

G. M. 33.15.741, *a—d*, provenance Sta. Barbara, find 7, (cf. p. 68).

- a.* Scapular fragment, from guanaco (*Lama huanacus*, Molina).
- b.* Proximal portion of a rib. Whether deriving from llama or guanaco is impossible of determination; the bone appears however rather narrow for deriving from guanaco.
- c.* Second lumbar vertebra of a young guanaco or llama. The body is somewhat broader and more massive than in the llama, while on the other hand the transverse processes and the spine are more in correspondence with the llama.

d. Phalangeal bone, probably of guanaco as it is considerably larger than the corresponding bone in a llama.

G. M. 33.15.743, *l—m*, and 33.15.744, provenance grave 2 (cf. p. 60) and find 6 (cf. p. 66), Sta. Barbara. The two bones G. M. 33.15.743, *l—m*, are two humeri and the bone



Fig. 150. Lower jaw of llama. Unquillo, La Candelaria.

G. M. 33.15.744 a femur of one and the same species. Lack of comparative material has made it impossible to determine the species, but they probably derive from some small South American rodent.

Göthenburg in November, 1936, (sgd).

Walter Kaudern.

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CONTENTS

	Page
Preface	7
I. The department of La Candelaria, its physical geography, and climatic conditions affecting its archaeological sites	11
II. A description of certain archaeological sites in La Candelaria, and of the research work carried out	21
Cuchiyaco	24
El Paso de los Antiguos (Toro Loco)	31
Quebrada de la Virgen	44
Santa Barbara (Los Morteritos)	54
La Banda	79
El Molino	80
El Quebrachal	83
Caspinchango	87
Angosto	96
Huanacocha	97
Agua Chica	115
La Puerta	115
Santa Lucia	120
Unquillo	121
Pantanillo (Loma Blanca)	131
III. Clay vessels from La Candelaria, not used as sepulchral urns.	138
Clay vessels with bulges	139
One-handled symmetrical clay vessels	152
Hanging vessels	155
Cylindrical or bottle-shaped clay vessels	158
Cup-shaped earthenware vessels (Rim-bosses)	159
Asymmetrical vessels	162
»Bailer»-shaped vessels	168
Intercommunicating vessels	169
Vessel with two massive conical projections	172
Vessel with »pan»-handle	173
Vessel of spherical form	174

Zoomorphic vessels	174
Bowls with anthropomorphous or zoomorphic ornamentation	177
Incised-ornamented bowls of greyish ware. Incised ornaments on bowls and larger clay vessels	178
The handle: its shape and method of affixing. Divers orna- mented fragments	193
Post-Columbian clay vessels	205
Vessels and fragments of brick-like ware with incised or paint- ed decoration	206
IV. Burial urn of Diaguitan origin	219
V. Objects of stone	221
Grinding stones and mortars	221
Stone celts	227
Various stone objects	244
VI. Detached earthenware finds (other than vessels) ...	255
VII. Objects made of shell	259
VIII. Objects of bone	264
IX. Objects of metal	267
X. Discussion of the archaeological material with regard to the bearers of the culture	270
<hr/>	
XI. Modern native pottery-making in La Candelaria	296
XII. Modern La Candelarian native grain stores	303
<hr/>	
<i>Appendix I. J. VILH. HULTKRANTZ: A brief report on an examination made of certain human skeletal remains col- lected during 1932 in the La Candelaria Department of the Province of Salta, Argentina, by S. Rydén, of the Go- thenburg Museum</i>	<i>306</i>
<i>Appendix II. WALTER KAUDERN: A brief report on an examination made of certain osteological remains collected during 1932 in the La Candelaria Department, of the Pro- vince of Salta, Argentina, by S. Rydén, of the Gothen- burg Museum</i>	<i>315</i>
<hr/>	
Bibliography	317

Some Observations on South American Arrow-poisons and Narcotics

A rejoinder to Professor Rafael Karsten

by

C. G. Santesson and Henry Wassén

I.

In a critical article¹⁾ aimed at Dr. HENRY WASSÉN, professor KARSTEN has also attacked myself, in continuation of earlier polemics.²⁾ As regards many of his points I might limit myself to referring to the article of mine that I quote below (Note 2). Certain passages of this article I am here obliged, although without touching upon every detail of Professor KARSTEN's exposition, to reiterate and to some extent to amplify.

In his latest article KARSTEN again emphasizes that »the chemical and physiological question of course falls outside the scope of my article . . . I approach the matter entirely as an ethnologist». In his »Notes», however, he sharply opposes my statement when I describe the Colombian *pakurú* poison that I have examined as being unique among South American arrow poisons by reason of its containing a specific cardiac poison which kills animals by arresting the

¹⁾ R. KARSTEN: *Arrow-poisons and narcotics in Western Amazonas*. Ethnological Studies, edited by Dr. W. KAUDERN, 1936, 2, pp. 68—77.

²⁾ R. KARSTEN: *Notes on South American Arrow-poison*. Soc. Scient. Fennica. Commentat. Humanar. Litterar., 1933, VI, 4. — C. G. SANTESSON: *Bemerkung über südamerikanisches Pfeilgift*. Ibid., 1934, VI, 5. — R. KARSTEN: *Addenda to my Notes on South American Arrow-poison*. Ibid., 1934, VI, 7.

action of the heart in systole. In taking this line of opposition, KARSTEN de facto enters the realms of chemistry and physiology (or, more correctly, that of toxicology). He means, it is true, that the *pakurú* poison, ethnologically speaking, *is used in exactly the same way as curare* among the Canelo and Jibaro Indians of eastern Ecuador — that is to say only in hunting, not in war — for poisoning blowgun darts, and the like. I am not justified in asserting that »there could not exist a similar poison for instance in those regions of Western Amazonas where I (KARSTEN) have travelled myself, and which, both geographically and botanically, are very imperfectly known«. This passage occurs in his latest article (p. 69).

Here I must in the first place object: surely the intrinsic nature or character of an arrow poison does not lie in *the method of its employment* — whether used in hunting or in war, or whether the projectiles be discharged from a blowgun or a bow, etc. — but in its chemical constitution, and in the toxic effect of its principally active component. And, as to this, I am in a position to maintain definitely that there exists a fundamental difference between the *pakurú* poison and *curare*.

In his latest article (p. 69) KARSTEN points out that in arrow poison from Cayapa Indians of western Ecuador I have established the presence of a cardiac poison, probably *pakurú* poison¹⁾ — hence cardiac poison also occurs in Ecuador. This is correct, so far. But I have shown that the poison in question *does not* exhibit any curare action on the endings of the motor nerves in the muscles. The circumstance that the Cayapas, who are in frequent contact with the Chocós of Colombia and often visit the country of the latter, use the same type of arrow poison, does not imply that the cardiac poison in question is mixed with the curare of Indians inhabiting other sections of Ecuador. Where a

¹⁾ C. G. SANTESSON: *Pfeil- und Fischgift aus Kolumbien und Ecuador*. Ethnological Studies, ed. by W. KAUDERN, 1936, 2, p. 26.

properly effective curare is at hand there is no need of the cardiac poison, and vice versa.

I have not averred that no specific cardiac poison may possibly occur in samples of curare from western Amazonas or other regions that have not yet been analysed, but I have said that none has so far been ascertained. Many samples of this kind have been examined by various authors, R. BOEHM in particular, and also by myself¹⁾, without any cardiac action having been established in their case. In certain species of curare, especially those of inferior quality (e. g. so-called «tubo-curare», put up in lengths of bamboo, and mostly originating from the region south of the middle Amazon river, or Solimões, i. e. «the poison river») there is a by-ingredient, known as «curine», which like the curarines derives from the Strychnos material proper, and in sufficient quantities has a *paralysing* effect on the heart. This is however something altogether different from the cardiac action of *pakurú*, as of digitalis, strophanthus, and other poisons, whose action consists in stopping the heart in state of contraction — in systole — i. e. «cardiac tonics».

¹⁾ KARSTEN writes (p. 70): «Of the numerous Ecuadorian arrow poisons the only one known to science is the one which I myself brought home from Canelos, and which Professor SANTESSON examined at my own suggestion, , , ». This examination I published in 1934 (see Skandinav. Arch. f. Physiol. 1934, Vol. 68, p. 202). BOEHM's numerous researches were published in 1897, and some of my earlier essays in this domain in 1927 and 1931. I have already referred to those works of mine (see my article of 1934, cited in Note 2, p. 330 above). It is surprising that, even as late as in 1936, KARSTEN is still able to assert that no other curare is known to science than his own, from eastern Ecuador. Again, I am not aware that I examined the poison in question at the request of KARSTEN («at my own suggestion»). When in his first article of criticism against myself (of 1933, see Note 2 on p. 330, above) I read that on his return from Ecuador in 1919 he had handed in a sample of Canelo curare at the Ethnographical Museum in Gothenburg, I asked its director, Dr. W. KAUDERN, to send me the sample for examination, which he kindly did in the autumn of 1933. Whether Dr. KAUDERN had previously obtained Professor KARSTEN's permission, I cannot now recollect.

I have, as mentioned in the footnote on p. 332, analysed the Canelos poison brought by KARSTEN to Gothenburg, and found it to consist of medium strong curare without exhibiting any trace of cardiac effect — thus confirming my statement that neither any kind of cardiac tonic, nor any other especially effective agent — apart from curarine — enters into its composition.

As will be remembered, KARSTEN¹⁾ relates how the Canelos in making up their arrow poison use from 25 to 30 different vegetable ingredients derived from various lianas, shrubs, tall trees, etc. He maintains — and again stresses in his latest article — that many of these ingredients might well in themselves be supposed to be poisonous. *I have never denied either the abundance of the ingredients or their possibly poisonous character* — having only maintained that in the experiments carried out these extra ingredients exhibited no toxic action. It should, however, be noted that the curarine contained in the samples in question is of such virulence that, in the small doses that were applied, *only* the action of the poison just referred to could be recorded. The symptoms produced were identical with those from pure curarine, only with the difference that the toxic effect was weaker in proportion to a lesser quantity of pure curarine contained in the curare dose.

KARSTEN mentions (bottom of p. 73, and on the following page) that in the curare from the Canelos 'Barbasco' — which is poisonous, and in particular used as fish-poison — formed an ingredient. From data given by ROSENTHAL,²⁾ I have on an earlier occasion advanced a suggestion that the Barbasco plant might be identical with *Jaquinia armillaris* L., or possibly *J. obovata* Jacq.³⁾ I have later, through WAS-

¹⁾ R. KARSTEN: *Beiträge zur Sittengeschichte der südamerikanischen Indianer*. Acta Acad. Aboens. Humaniora 1,4. Helsingfors 1920.

²⁾ ROSENTHAL: *Synopsis Plantarum Diaphoricarum*. Erlangen 1862, p. 504.

³⁾ C. G. SANTESSON: *Skand. Arch. f. Physiol.*, 1934. Vol. 68, p. 205.

SÉN, obtained a sample of Barbasco drug from Colombia, which proved to derive from *Tephrosia toxicaria* Pers.¹⁾ Perhaps the somewhat old information given by ROSENTHAL is in error. The root of Barbasco — the part of the plant used for poisoning purposes — proved fairly effective in the case of small fishes, but much less so with frogs. In the latter kind of animal a pretty large dose showed a slowly progressing paralysing effect which only on the third day (not, as KARSTEN says, »on the following day») brought on death. Even if Barbasco had been added to the curare in question, the former would not have been able to assert itself at the experiments.

It is further stated by KARSTEN (p. 75) that to the Canelo curare a very strong drug of *Capsicum* had been added. If such had been the case, a very intense locally irritating effect of that poison would have been expected. The principal irritant contained in the *Capsicum* species is non-volatile, and probably not easily disintegrated. By reason of no locally irritating effect being observable in the Canelo curare it is improbable that it could have contained *Capsicum*. Concerning *Capsicum* as an added ingredient in curare KARSTEN writes (p. 75): »there is hardly any doubt that the Indians are right in stating that it contributes towards causing a paralysis of the muscles». So far as the effects of the *Capsicum* poison are known, there is no reason for attributing any muscle-paralysing agency to it. — Seeing that KARSTEN makes special mention of the large number of ingredients contained in the Canelo curare I only wish to remark that other explorers that have been present at the preparation of curare, among others HUMBOLDT, SCHOMBURGK and CASTELNAU, do not mention so large a number of ingredients.

In his article KARSTEN writes (p. 70) that I found his Canelo poisons to be working »extremely slowly». This is a strange piece of misapprehension. An adequate dose on the

¹⁾ SANTESSON: *Pfeil- und Fischgift aus Kolumbien und Ekuador*. Ethnol. Stud., ed. by Dr. W. KAUDERN, 1936, 2, p. 23.

contrary acted rapidly: a frog after only a few minutes exhibited »hochgradige Schwäche«, and a rabbit died at the end of 10 minutes. But on the other hand I mentioned that *in comparison with certain other curare samples* the poison in question did not appear to be particularly strong. That it worked so »extremely slowly« KARSTEN (p. 70) seeks to explain by »deterioration« of the poison. Seventeen years had passed since it was brought across to Europe. »Even a layman understands that it must be extremely difficult, or even impossible, to draw positive conclusions from the examination of such a poison«. And in support of this he cites the following passage from the pharmacologists HANS H. MEYER and R. GOTTLIEB:¹⁾ *''Die wirksamen Bestandteile des Extraktes sind leicht zersetzlich. Nach Europa gebracht, war deshalb das Gift... weit weniger wirksam als frisches Curare«.* I will not deny that curare, *especially if it has become damp*, will in time deteriorate in strength. *But if it has been preserved in a dry state* it will for a very long time remain highly potent. LEWIN mentions a sample of curare which *after 140 years was still very effective.*²⁾ E. POULSSON³⁾ relates how from an old apothecary's shop in Norway he received for examination a tin which had been found in the making up of the inventory, and was labelled »strong poison for killing whales«. Evidently it had been meant for smearing on harpoon-points so as to paralyse and thereby more easily catch the huge animals. The tin contained a dark-brown, granulated mass, of intensely bitter

¹⁾ *Experimentelle Pharmakologie.* Berlin 1922, p. 1.

²⁾ L. LEWIN: *Die Pfeilgifte*, Leipzig 1923, pp. 439—440: »Wüsste man nichts weiter über diese Fähigkeit als die Tatsache, dass ein sicher von Karaiben herstammender Pfeil, nach 140 Jahren auf seine Giftigkeit geprüft, das getroffene Tier alsbald sterben liess, so würde man den völlig zutreffenden Schluss machen müssen, dass das Gift, nicht wie angenommen wurde, von Hippomane Mancinella L. stammen konnte, sondern ein gutes Curare gewesen sein müsse.«

³⁾ *Notiz über eine eigentümliche Anwendung von Kurare.* Arch. f. exper. Pathol. u. Pharmakol., 1916, Vol. 80, p. 50.

taste. It consisted of fairly powerful curare, which killed a rabbit in a dose of 3 — 4 mg. per kilogramme — in other words, it still possessed the strength of so-called «calabash curare». There can be no doubt of the sample in question being of a very considerable age. Thus I am — contrary to KARSTEN's belief — by no means the only pharmacologist that has had experiences of a similar kind. In the pharmacological laboratory of the Caroline Institute in Stockholm — as well as no doubt in other laboratories in Europe and elsewhere — there are original samples of curare which have been obtained from South America many decades ago but still retain a high degree of strength.

As regards the habitation areas of the Canelo and Jibaro Indians in «eastern Ecuador», some confusion appears attached to this matter. According to an earlier map (of 1899)¹⁾, Ecuador extended far in the east and, as noted on that map, the Canelos and the Jibaros definitely dwelt within the western portion of the country. Later maps give the eastern part as being largely «disputed territory», or indicated as belonging to Peru. If such was the case at the time of KARSTEN's visit, then my statement that the Indian tribes in question resided within the western part of Ecuador is doubtful or erroneous.

I next take the liberty of remarking upon a statement contained in another of KARSTEN's works.²⁾ Here he writes that curare «brings coagulation and a paralysis of the muscles». This is not correct. Coagulation (stiffening) of the muscles does not occur in curare poisoning. In this, they are quite flaccid and soft, like muscles in their normal, not contracted, state: they are, in fact, *not per se paralysed*. If exposed to electrical stimulus they will perform violent contractions. On the other hand they cannot be put in motion

¹⁾ Cf. a sketch map in C. G. SANTESSON: *Skandinav. Arch. f. Physiol* 1934, Vol. 68, p. 204.

²⁾ R. KARSTEN: *The Head-Hunters of Western Amazonas*. Soc. Scient. Fennica. Comment. Humana. Litterar., 1935, VII, 1. p. 152.

by excitation of the motor nerve; and if they are in their natural positions in a live, curare-poisoned animal — e. g. in a curare-affected frog — it cannot, even by exercising its volitional force to its utmost, contract its muscles. *This is because the poison has made the endings of the motor nerves in the muscles unable to transmit the motor impulses from the nerves to the muscle substance. This is the typical effect of curare.* There are, however, other poisons which — especially if a muscle be immersed in a weak solution of them — by electric excitation produce muscular rigidity, a sort of coagulation of the muscle substance, viz. caffeine (in *Rana temporaria*), sapotoxins, and certain poisons contained in the skin secretions of batrachians.¹⁾ The cardiac rest in systole which is produced by the cardiac tonics above referred to (*digitalis*, *strophanthus*, *pakurú*, etc.) as well as by sapotoxins and barium salts, are of a similar character. Probably KARSTEN was misled by a statement found in R. SCHOMBURGK. The latter says (*On the Urari: The deadly arrow-poison of the Macusis, an Indian Tribe in British Guiana*, Adelaide 1879, p. 17) that curare produces »stiffness or inflexibility and coagulation of the fibres, exactly the same as with an animal killed in a mechanical way«. SCHOMBURGK, not being a physiologist, here evidently confuses *rigor mortis* with the effect of curare. An animal which has died from curare-poisoning gradually assumes the stiffness of death, in the same way as does an animal »killed in a mechanical way«. It may however be noted that, in an animal that has died from curare, *rigor mortis* generally sets in by slow degrees, as in the death-preceding moments there appear only very slight muscular contractions, if any at all. The state of rigidity that sets in after death has nothing to do with curare-poisoning.

Towards the end of his critical article KARSTEN attacks WASSÉN, and indirectly also myself, in connection with cer-

¹⁾ C. G. SANTESSON: *Pfeil- und Fischgift aus Kolumbien und Ekuador* Ethnol. Studies, 1936, 2, p. 20.

tain »narcotics . . . from northern (should be western!) Colombia». First of all there is the meaning of the word »tonga», the name of an intoxicating beverage which, inter alia, produces visions. Asked by WASSÉN to explain the significance of »tonga», I told him, following ROSENTHAL,¹⁾ that the intoxicant in question is prepared from seed capsules of the plant *Datura sanguinea* R. et P. belonging to the Solanaceae. That »tonga» is made from this plant is also stated by E. von BIBRA²⁾ who describes it as »yerba de huaca», after TSCHUDI, who travelled in the Andes of South America, and gives a description of the phenomena observed in an Indian after drinking »tonga».³⁾ It therefore appears very probable that in former times there existed a vision-producing, intoxicating beverage known as »tonga», which was prepared of materials obtained from *Datura sanguinea*.

As regards the above information, KARSTEN (p. 76) now says that in this connection WASSÉN has confused three (?) different plants. He (KARSTEN) maintains that the word »tonga» is to be taken as signifying beverages prepared from two different plants. One of these plants — also known as »pinde» — from which visions of villages, cities, etc., arise, »is not *Datura Sanguinea*, but most certainly a species of *Banisteria*». In support of this assertion KARSTEN refers to a passage in SEVERINO de SANTA TERESA,⁴⁾ in which is mentioned a beverage prepared from a shrub known as »Ibaga» (»tonga»). This beverage is swallowed for the purpose of producing visions that may lead to the discovery of a thief or tracing stolen goods. The passage in question,

¹⁾ D. A. ROSENTHAL: *Synopsis plantarum diaphoricarum*. Erlangen 1862, p. 453.

²⁾ E. von BIBRA: *Die narkotischen Genussmittel und der Mensch*. Nürnberg, 1855, p. 141 et seq.

³⁾ J. J. von TSCHUDI: *Peru. Reiseskizzen aus den Jahren 1838—1842* vol. 2, St. Gallen 1846, pp. 21—23.

⁴⁾ SEVERINO DE SANTA TERESA: *Creencias, Ritos, Usos y Costumbres de los Indios Catios de la Prefectura Apostólica de Urabá*. Bogotá 1924, p. 133.

which is cited by WASSÉN, gives no further information as regards this plant beyond its being a shrub (which definitely argues against the *liana* *Banisteria* being referred to!). It appears as if it is upon the appellation »pinde» that KARSTEN bases his opinion that *Banisteria* is the plant here referred to.¹⁾

The other shrub-like plant is by KARSTEN supposed to be *Datura arborea* or *sanguinea*.²⁾ He maintains that this is a case of *synonyms*, which however is erroneous. These two species are quite distinct from each other. He refers (bottom of page 76) as regards the plant in question to his work »The Head-Hunters of Western Amazonas» (Helsingfors 1935, p. 432 et seq.), where he gives a detailed ethnographical description of the use of the *Banisteria* *liana* and the *Datura* shrub among the Indians of western Amazonas. His account of this makes interesting reading. Two different beverages are there dealt with. One, »natéma», is obtained from the *liana* *Banisteria Caapi* Spruce, fam. Malpighiaceae, the other, »maikoa», from *Datura arborea* L., fam. Solanaceae. The

¹⁾ With what has just been adduced, it is of interest to compare W. GOLDEN MORTIMER, *Peru History of Coca*, (New York 1901, p. 212—213): »Some of the Indians gather the leaves of a plant they term *huaca* or *huacacachu*. It is a running vine with a large obovate leaf, pale green above and purple beneath, . . . Von TSCHUDI probably refers to this leaf in what he describes as *bovachero*, or *datura sanguinea* . . . A liquor is prepared from the leaves which the Indians term *tonga*, the drinking of which, they believe will put them in communication with their ancestors, . . .». As regards the above mentioned characteristics of *huaca* — of its being a »running vine with a large obovate leaf, pale green above and purple beneath», Professor ROBERT FRIES has kindly informed me that this description definitely places the shrub *Datura sanguinea* out of the question, but instead appears to point to some species of *Banisteria*. It would therefore seem that the reference by KARSTEN to SEVERINO DE SANTA TERESA is in error.

²⁾ According to G. LAGERHEIM (*Monographie der ecuadorianischen Arten der Gattung Brugmansia*: ENGLER: Botan. Jahrb. 20 [1895] pp. 655—668, T. XI), *Datura sanguinea*, like *D. arborea*, belongs to the tree- (or shrub-) like forms of the genus *Datura*, but is botanically specifically different from *Datura arborea*. LAGERHEIM refers the Ecuadorian tree-like forms of *Datura* to the genus *Brugmansia*.

latter are said to possess »two subspecies«, *Datura arborea* L., and *D. stramonium* L. The former has *white*, the latter »yellow-red flowers«. The statement as regards *D. stramonium* is obviously in error. This is a plant essentially peculiar to the Old World; it is generally described as a *herb*, with a height of 1 to 1.6 m., and its flowers are *white*. It is of a type altogether differing from that of *arborea* and *sanguinea*. *The shrub that, like Datura arborea, gives material for »maikoa«, and which has yellow-red flowers, is probably Datura sanguinea R. et P.* — As regards *D. arborea* — and presumably also *D. sanguinea* — these are shrubs, consequently possessing woody stems, with a height of about 3 metres and more.

Speaking of the *Datura* species in question — KARSTEN conceiving them as one species — he writes (p. 76) that »its effects are entirely different from those of the liana *Banisteria*«. As regards this statement LEWIN in another work¹⁾ adduces both experiments on animals and observations on human subjects, in which are shown a number of symptoms produced by *Banisteria*, demonstrating its effects compared with those of *Datura* — as, e. g., increased secretional action and, at all events in *one* human case, repeated vomiting — in the same way as the effect described by KARSTEN as produced by the »natéma« beverage on Indians (while the *Datura* poisons, like other tropeïnes, arrest secretions). Both of these poison categories dilate the pupil, produce emetic effect and — which is their most important characteristic — act as cerebral irritants with, inter alia, a tendency towards visions and hallucinations. LEWIN (p. 142) emphasizes that »die sensorielle Erregung (from *Banisteria*) . . . , reiht sich denjenigen an, die etwa durch tropeinhaltiges Material (i. e. such as is found in *Datura*, *Atropa*, *Hyoscyamus*, *Scopolia*) erzeugt wird«. If there exists any difference as regards psychic symptoms it would be that the *Banisteria*

¹⁾ L. LEWIN: *Untersuchungen über Banisteria Caapi Spr.* Arch. f. exper. Pathol. u. Pharmakologie 1928, Vol. 129, p. 133 et seq.

poison does not affect consciousness to such a high degree as the tropeïnes do. It may however be noted that even the former is capable of producing distinct »Gesichtshalluzinationen». About a dog which had been poisoned with banisterine he says that it gives an »Eindruck eines tollwütigen . . . erinnert lebhaft an den entsprechenden (Symptomen) der Tropeinvergiftung». LEWIN, who was the first to produce banisterine and to examine its action, would certainly not have been prepared to accept KARSTEN's pronouncement in regard to the two poisons that their »effects are entirely different».

Concerning *Datura arborea* (»maikoa»), GÜNTHER TESSMANN (*Die Indianer Nordost-Perus*, Hamburg 1930, p. 352 et seq.) states that from it is produced a beverage which gives »magische Vorstellungen» of a kind similar to those produced by the »Kaapí» beverage; it is also applied in the form of a clyster. In this connection he refers to KARSTEN's »Beiträge . . . etc».¹⁾

As regards the psychical effects of the Banisteria beverage I have latterly received in my mail an interesting piece of information. Dr E. H. SNETHLAGE, of the Museum für Völkerkunde at Berlin, in 1933-1934 visited the border districts between Bolivia and Brazil, inter alia the region surrounding Rio Cautario, an affluent to Rio Guaporé. There he met a half-breed woman from Peru who told him that her »famuli» habitually made themselves drunk on a beverage prepared from Banisteria, known as »huascar», singing the while — as an important component of the ritual — a lengthy song. When properly drunk they had visions of animals, particularly snakes, »until the spirit was freed, and able to travel where it desired». (From a work to be published).

It is however strange that in later times the name »tonga» seems to have been discarded from botanical, toxocological

¹⁾ KARSTEN: *Beiträge zur Sittengeschichte der südamerikanischen Indianer*. Acta Acad. Aboens. Humaniora I, 4. Åbo 1920, p. 48 et seq.

and even ethnological literature; *Datura sanguinea*, too, in its capacity of providing material for an intoxicating beverage, appears to have become disregarded. In LEWIN's great work, »Gifte und Vergiftungen» (Berlin 1929, p. 687), under a string of different names (pinde, nepe, etc.) mention is made of the beverage prepared from the liana *Banisteria Caapi* Spruce, with its active component, the alcaloid known as *banisterine*. On the other hand LEWIN in this work does not refer to the name »tonga», either in connection with *Banisteria* or *Datura*. *D. sanguinea* is not mentioned. The fact of the last-mentioned species having been overlooked by certain authors would seem to be due to insufficiently far-reaching botanical knowledge. That the name »tonga» has not, however, entirely fallen into disuse is apparent from the fact that WASSÉN as late as in 1934 came across it among Chocó Indians in western Colombia. On the subject of names Dr. SNETHLAGE writes: »Meiner persönlichen Erfahrung mit Benennungen einer Sache durch die Mischbevölkerung zufolge, möchte ich annehmen, dass »Tonga» wohl hier für das eine, dort für das andere, wohl auch für beide zusammen angewandt wird».

In further elucidation of the »tonga problem» I will here cite yet another piece of written information, which I have received from Dr. GEORG FRIEDERICI (Ahrensburg, Holstein). He lately wrote me: »dass Tonga in Perú der Name eines aus *Datura* hergestellten Getränkes ist. 'En el Perú, tonga: Bebida que se hace del fruto del floripondio». Floripondio ist aber in Perú, Bolivia, Argentinien, auf Cuba die Bezeichnung für *Datura arborea*. Tonga ist kein Khet-schua-Wort, vielleicht überhaupt kein Eingeborenen-Wort, sondern das spanische: tonga, tongada(?)». This latter pronouncement seems to imply that the name »tonga» has been left out of consideration by reason of its not being a true native word but belonging to such Spanish loan-words as are occasionally used also by the Indians.

According to information with which I have supplied him,

as regards *Datura sanguinea*, WASSÉN has written that it »no doubt contains an alkaloid poison with strongly psychical effects«. KARSTEN now emphasizes that about this there can be no doubt, as, according to a work by LEWIN,¹⁾ the *Datura* in question contains the alkaloids atropine and scopolamine. This work of LEWIN's I have not had accessible, and I was broadly speaking without any authentic information as to the active components of this particular species of *Datura*. As, however, the plant in question belonged to this family, and caused the symptoms described, I considered it most probable that, like *D. stramonium* L. and other closely related Solanaceae (*Atropa belladonna* L., *Hyoscyamus niger* L.), it must contain alkaloidal poisons of the tropeine group. As regards the poisons contained in the *Atropa* species, what is peculiar about this species is that, while fresh, its leaves and young shoots contain only very little *atropine*, while this substance is almost, if not altogether, absent in older specimens. In its stead there is present *hyoscyamine* which, however, when chemically treated — or introduced into an animal system — with extreme readiness changes into the isomeric substance atropine. In *Hyoscyamus*, hyoscyamine is an essentially active component, while another such is *scopolamine*. In poisoning with *Atropa* or *Hyoscyamus*, through the formation of atropine the effect of the last-mentioned alkaloid is produced. The violent psychical irritation symptoms (frenzied attacks) are however in *Hyoscyamus* poisoning modified by the scopolamine which blunts the psychical effect and produces a more subdued state of intoxication, with visions and hallucinations. If, as LEWIN states, (vide supra), *Datura arborea*, or *D. sanguinea*, contain atropine (hyoscyamine) and scopolamine, this would explain the psychical symptoms that occasionally, it is true, may exhibit a maniacal character, but often are more subdued, and moreover in many respects resemble those produced by *Banisteria*.

¹⁾ L. LEWIN: *Phantastica, narcotic and stimulating drugs*, p. 129.

WASSÉN mentions that the »tonga» beverage among the Chocó was occasionally also known as »koko», a name which made him associate it with »coca», the drug so largely used in western South America as a nerve tonic. KARSTEN dismisses as of no importance any connection with coca, and writes on that point: »I have never heard of their (the coca leaves) being used for purely ceremonial purposes — to produce visions, etc.» — That coca was used for ceremonial purposes is mentioned by v. BIBRA (l. c., p. 152). At the sacrifices the priests fumigated with coca leaves, scattered them over the sacrifices, and at all religious ceremonies they had coca leaves in the mouth. The capability of coca of producing peculiar psychical effects is well known. I only need to refer to the self-experiments carried out by the Italian physiologist and psychologist, MANTEGAZZA. Of this he writes: »Supported by two coca leaves, as by a pair of wings, I flew through 77,348 worlds, each more wonderful than the other». ¹⁾ And again: »I prefer a life of ten years with Coca to a life of a million centuries without Coca (»Io preferiseta una vitta di 10 anni con Coca che un di 1,000,000 secoli senza Coca»). ²⁾ — It may be supposed that MANTEGAZZA would not have been so enraptured by his flight through all those worlds if on his dream voyage he had not had wondrous and delightful visions and experiences. By this I do not mean that the name »koko» must necessarily imply that the »tonga» beverage contained coca leaves.

The pharmacological details that I have here brought forward may very conceivably, to students of ethnography and ethnology, appear alien to the subject, or even of no particular interest. That I have been under the necessity of citing them must not be laid at my door. I should be greatly beholden to Professor KARSTEN if for the future he would

¹⁾ E. POULSSON: *Lehrbuch d. Pharmakologie*. Leipzig-Oslo, 1934, p. 98, note.

²⁾ W. GOLDEN MORTIMER: *Peru History of Coca*, New York 1910, p. 408.

restrict himself to his own domain, where he is a recognized authority, but leave to experts the treatment of any particular subject from a pharmacological and toxicological point of view.

What I have said above constitutes my final word in this controversy.

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Stockholm.

Additional Note.

While the foregoing paper was in the press, LEWIN's book: »*Phantastica. Die betäubenden und erregenden Genussmittel*» (2nd ed., Berlin 1927), cited above on page 343 after KARSTEN, came into my hands. This edition is manifestly not the same as that used by KARSTEN. *Datura arborea* L. and *D. sanguinea* R. et P. (page 182) are here sharply distinguished. On page 183, TSCHUDI's description of the effect of »Tonga» on an Indian is described, without any data regarding the source. I have been unable to find confirmation of KARSTEN's statement (p. 76 in his latest critical article) that »*Datura arborea* or(!) *sanguinea*» contains atropine and scopolamine in the edition of »*Phantastica*» now accessible to me, but this of course does not mean that the statement may not be true and apply to both of the two different varieties.

C. G. Santesson.

II.

In Professor C. G. SANTESSON's above published reply to Professor R. KARSTEN's controversial article »*Arrow-poisons and narcotics in Western Amazonas*» the essential error in KARSTEN's polemics has already been pointed out, viz. that he — in spite of expressly professing to »approach the matter as an ethnologist» — nevertheless deliberately disregards

an experimentally proved toxicological fact, namely that of the *pakurú* poison of the Chocó Indians being, in point of lethal action, of a nature distinctly different from that of the so-called curare poisons. As, however, KARSTEN appears to have most regrettably misapprehended the purpose of the review I make in my *Notes on Southern Groups of Choco Indians in Colombia* (pp. 92—94) of the earlier polemics between himself and SANTESSON may I here be allowed to add a few observations. In his retort, which he addresses to myself, he inter alia writes that I am »giving the reader an entirely false conception about the real object of the controversy . . . » (p. 68). In a matter like the present it must be perfectly clear to anyone that in a work like *Notes on Southern Groups of Choco Indians*, dealing with the use and preparation of poisons among different groups of Chocós, I cannot very well avoid referring to writings on this subject by KARSTEN and SANTESSON, respectively. I further feel convinced that no one that has read KARSTEN's contribution there cited — in particular his first *Notes on South American Arrow-poison*, among other things containing his wanton, and to the subject irrelevant, attack upon the then recently deceased ERLAND NORDENSKIÖLD and his research methods — will maintain that my citation was uncalled for. During my sojourn among the southern Chocó Indians — a period which I admit was of exceedingly brief duration as compared with KARSTEN's by himself elaborately recorded 4-years' stay in Ecuador — I devoted my most special interest particularly to Chocó knowledge of different arrow-poisons. With regard to the here discussed *pakurú* poison I moreover succeeded in obtaining material sufficient both for a renewed toxicological examination by a specialist to be carried out, and for botanical determination of the poison-producing tree. For the former, Professor SANTESSON is responsible, and the results arrived at by him were published (see note, p. 330), when it was again established that the *pakurú* poison, with its specific cardiac action *still remains* — in spite of what

KARSTEN so far may have written about his researches in Ecuador — *unique* among South American arrow-poisons. Further, and before making a few minor remarks as to details I wish to declare my principle of regarding — as KARSTEN does — these questions purely from an *ethnologist's* point of view. I do not, however, propose to be so bigoted as to insist a priori upon the ethnological aspect of the matter, i. e. adopting it as a basis in order to categorically, although more or less hypothetically, maintain that any particular poison is used within an area where so far it has not actually been shown to exist. In the particular question here at issue — i. e. the possible, although so far unverified, occurrence in eastern Ecuador of a poison possessing the same specific cardiac action as *pakurú* — it appears to me most proper also for an ethnographer to proceed from facts that have been scientifically established, in this case with particular reference, as SANTESSON remarks in the foregoing, to an arrow-poison's »chemical constitution, and the toxic effect of its principally active component«. Ethnographical comparisons are at times apt to prove altogether too halting. As an example of this may be mentioned that KARSTEN has pointed out the correspondence found in the fact that »like the *pakurú* poison, the arrow-poisons in eastern Ecuador are used only for the chase, not in war. . . » (p. 69). As to this, it may at once be remarked that the Chocó formerly quite well may have used *pakurú*-poisoned arrows also in war. Of this, however, we know nothing. We only know that the tribes of Chocó gave the Spaniards a warlike reception. It however appears that they were pacified at an early date, and that nowadays — no doubt since long ago — they are quite peaceable, even among themselves. A comparison between them and the still warlike Jibaro must consequently be misleading.

In passing it may be remarked that the earliest literature dealing with the Chocó has very little to tell us as to the character of their arrow-poison. In PEDRO SIMON (*Noticias*

Historiales, t. 5, Bogota 1892, p. 148) it is simply stated in a vague way that they used «alguna hierba de manzanilla poco fuerte». Whether in this case, as among «los Caribes flecheros» *Hippomane mancinella* is referred to is however uncertain. Even the deadly poisonous quality of this tree has been called into question.¹⁾ SANTESSON writes me that «the sap of this tree may strictly be said to possess a locally irritating power, but it is not poisonous to any very great degree. It may therefore possibly be used as an added ingredient in arrow-poison, although it cannot constitute the principal component».²⁾ In his chapter on «manzanillo» OVIEDO expressly states that other ingredients were added to this poison.³⁾ The word «manzanilla» is no doubt used in a very general sense in the early literature. Of great interest in this connection is however that the final *kurú* in the compound word *pakurú* occurs in words for manzanilla and poison both among the Islands Caribs and the Chaimas in northern Venezuela. The well-known authority on the Carib Indians and their languages, Mr. C. H. de GOEJE, with whom I had the pleasure of discussing this problem has written me the following: «The word *buku-ru*, poison, arrow-poison, manzanilla, belongs to the men's language of the Island Caribs and without doubt it originates from the Kaliña (Caribs of Guiana). In present-day Kaliña *epu-ku-re* = tree-juice or resin (*epu* stem of a tree, *ku* juice, fluid, *-re* possessive suffix, may also be *-ru* in harmony with the

¹⁾ L. LEWIN: *Die Pfeilgifte*, Leipzig 1923, p. 440; «Der Milchsaft des Manzinellen-Baumes besitzt nur die Fähigkeit, an Geweben Entzündung zu erzeugen, mit denen er in innige Berührung gelangt. Durch Mengen davon, die an einem Blasrohrpfeile haften, kann weder Tier noch Mensch Vergiftet werden».

²⁾ Cf. C. G. SANTESSON in «Comparative Ethnographical Studies» edited by ERLAND NORDENSKIÖLD, Vol. 9, Göteborg 1931, p. 165.

³⁾ OVIEDO Y VALDÉS: *Historia general y natural de las Indias*, t. I. Madrid 1851, p. 345—346: «Es esta Isla Española, Innumerables manzanillos hay, de los quales los caribes acostumbra con otras mixtiones ponçoñosas haçer aquella diabólica hierva, con que tiran sus flechas».

preceding vowel; $l=r$)». For the following quotations and explanation of Carib words I am thankful to De GOEJE:

FRANCISCO DE TAUSTE¹⁾ (p. 27: Chaymas): «Flecha de veneno, ð mançanilla: *Pureu*».

MATIAS RUIZ BLANCO²⁾ (p. 186): «Mançanilla, arbol: *Pucuri*».

RAYMOND BRETON³⁾ (p. 136): «empoisonnement, *lababourouni*; ma flèche est empoisonnée, *laboubourou touâgo* (upon) *nihé-peti* (my arrow); il l'a empoisonné, *kababouralôa*».

— — (p. 236): «mancenille, *balaô* (probably «sea») -*boucourou*».

— — (p. 302): «poison, *boucoulli*, *tiboucoulou*, *toubôcora*».⁴⁾

— — [*Dict. Caraïbe-Français*] (p. 67): «*balaô*-*boucourou*, Mansenilier qui porte vne pomme de bonne odeur, mais venimeuse, les Sauvages donnent vn coup de hache contre cét arbre, d'ou il sort vn lait qui est pur poison, dans lequel ils trempent le bout de leur fleches».

— — (P. 85): «*boûcouli*, venin, poison, *ti-boûcoulou bouléouïa* (arrow), le laict de mansenilier, ou autre chose venimeuse, ou ils trempent le bout de leur fleches pour les empoisonner».

The Chocó word *pakurú* is thereby explained, seeing that the Nonamá-Chocó word for tree is *pá*, and the poison is obtained from the lower part of the trunk of a *Perebea* of the family *Moraceae*. On an earlier occasion I have been led to infer, judging from Indian traditional material, the presence of Carib influence in northwestern South America among the Cunas and Chocós,⁵⁾ and this would therefore

¹⁾ *Arte Bocabulario Doctrina Christiana y Catecismo de la Lengua de Cumana* (Ed. JULIO PLATZMANN: Algunas obras raras sobre la lengua Cumanagota, Vol. I), Leipzig, 1888.

²⁾ *Arte y Tesoro de la Lengua Cumanagota* (Ed. PLATZMANN: Algunas obras raras etc. Vol. III), Leipzig, 1888.

³⁾ *Dictionnaire Français-Caraïbe*. Réimprimé par JULES PLATZMANN. Leipzig, 1900.

⁴⁾ Cf. v. MARTIUS: *Zur Ethnographie Amerika's zumal Brasiliens* (Leipzig, 1867), p. 654: «Von den Callinago der kleinen Antillen wird berichtet, dass sie ihre Pfeilspitzen einfach mit dem Milchsafte des Mancenillbaumes (*Hippomane Mancinella*) vergifteten, den sie Tiboucoulou bouleouâ, Gift fürs Pfeilrohr, nannten».

⁵⁾ HENRY WASSÉN: *Mitos y cuentos de los Indios Cunas* (*Journal de la Société des Américanistes*, n. s., t. XXVI, 1934, p. 1—35, Paris), p. 29;

constitute yet another interesting common element. In this connection it may also be pointed out that KARSTEN for other reasons thinks it probable that »the Indians of the Amazon territory» obtained their knowledge of how to prepare arrow-poison from the Carib Macusi of Guiana¹). As to whether the interesting similarity between the word *pakurú* and the word *bakua*, recorded by WHIFFEN (*The North-West Amazons*, London 1915, p. 308) as the Boro Indian name for arrow-poison, may be due to mere accident, I am not prepared to pronounce an opinion.

After this digression let us now return to the criticisms levelled at me by KARSTEN. On p. 71 he writes: »Dr. WASSEN, stating that in the *pakuru* poison of the Chocó there is only one active element, the *pakurine*, has some doubt as to whether the curare of the Canelos Indians is really composed of so many ingredients as I have stated». This is an obvious perversion of facts. In the first place I have never asserted that the *pakurú* only contains a single active element, but only stated (*Notes*, etc., p. 93), on the authority of SANTESSON's empirical observation, that its action is dominated by the glucoside *pakurine*, and that no extra ingredients were added on the occasions I had of watching the preparation of the poison. Further, I have never doubted — and no more has SÄNTESSON — the verity of KARSTEN's statement as to the presence of »25 to 30 different ingredients, all obtained from the plant world» in the true Canelos poison. I have only made the assertion, based on expert pharmacological evidence, that »however many ingredients KARSTEN's curare may consist of, many of which possibly may possess

Världsträdsmotivet i några indianska myter (Ymer, 1934, Stockholm, pp. 249—261).

¹) R. KARSTEN: *The Head-Hunters of Western Amazonas*, Helsingfors 1935, p. 144: »The Macusi Indians of Guiana are the best known of the South American arrow-poison makers, and it is possible that this invention — one of the most ingenious of those of savage peoples — was originally passed on to the Indians of the Amazon territory».

specific properties — which, besides, has not been proved — *the effect of the prepared poison is entirely governed by the exceedingly poisonous substance, curarine*» (p. 93). This is an assertion I still make free to hold responsibility for so long as no evidence by actual experiment has been adduced in proof of the contrary. May I further be allowed to retain as my opinion — without disbelieving in the 25 to 30 ingredients in the Canelos curare — what on p. 100 in my above-cited work I have pointed out as regards the Chocós: »It is beyond doubt that the Indians here dealt with possess considerable knowledge of plants with poisonous properties. Mixing several poisons together, may, as noted by KARSTEN, possibly also occur, but I have observed nothing in confirmation of any supposition that among the the Chocó such poison mixtures play such an important part as among the Ecuadorian tribes studied by KARSTEN».

There is no denying the fact that observers other than KARSTEN have, concerning additional ingredients in the preparation of curare, expressly stated that nothing of importance, except the Strychnos-species, is admixed. No doubt individual poison-makers may use specific methods of their own, such as, e. g., adding several different plant juices, and the like, even *among one and the same tribe*. KARSTEN to this point rejoins (p. 73) that SCHOMBURGK enumerates »in all *nine* different ingredients of which the *ourali* poison was composed, and of these only three were identified as Strychnos species». In his rejoinder KARSTEN does not, however, cite — as he has nevertheless done in another place¹⁾ — the passage in SCHOMBURGK which in ROTH's translation runs: »Of all the many myths about the manufacture of Urari in association with pounded poison-fangs of the most venomous snakes, of ants, capsicums, etc., — articles which so many travellers, who have witnessed its preparation, maintain they themselves have seen added, I

¹⁾ KARSTEN: *Beiträge zur Sittengeschichte der südamerikanischen Indianer*, p. 5. (Acta Acad. Aboensis, Humaniora I: 4, Åbo 1920).

have at least noticed nothing amongst the Macusis, although their poison is the most celebrated and most rapidly effective of any between the Amazon stream and the Orinoco. My old poison-maker, from whom I made enquiry, told me that neither the one nor the other was necessary and that he never added these, at the same time denying that they would contribute to its quicker action». ¹⁾

SCHOMBURGK's text is, according to KARSTEN, polemical against WATERTON, who visited the Macusi at an earlier date, and reports several admixtures. »Es liegt indes keine Veranlassung vor die Richtigkeit der Angabe Watertons zu bezweifeln» (KARSTEN, *Beiträge* etc., p. 5). No, there does not, nor is there, I may add, any reason for doubting SCHOMBURGK's statement. It may be that just WATERTON happened upon an individual poison-maker who made use of a plurality of ingredients.

Further, the importance of added ingredients with regard to consistency should not be underestimated. Concerning the poison from »bejuco de Mavacure», a kind of curare from Esmeraldas, on the upper Rio Orinoco, HUMBOLDT defini-

¹⁾ RICHARD SCHOMBURGK; *Travels in British Guiana*. Transl. by WALTER E. ROTH, Vol. I, p. 356. Georgetown, 1922. — Cf. R. SCHOMBURGK: *On the Urari: The deadly arrow-poison of the Macusis, an Indian Tribe in British Guiana*. Adelaide 1879, p. 5: »Here my brother undertook to make an experiment himself to extract the poison from the bark of *Strychnos toxifera* alone. For that purpose he took two pounds of the bark, which he pounded, put it into a pot, adding to it a gallon of water. He let this remain for twenty hours, putting half of the extract — which already had assumed a brown color — into another pot, boiling it over a slow fire until it got to the consistency of treacle, and during this process the remaining extract was added. Two fowls were wounded, and the poison was inserted — in the foot of one, and in the neck of the other. The effects of the poison appeared after the lapse of five minutes; but the second — wounded in the neck — died in twenty-seven minutes, and the other in twenty-eighth after the wounds. This was a sure proof that the *Strychnos toxifera* alone, and without the admixture of other ingredients, contains its deadly properties, and that any other additions are not essential to the strength of the *urari*».

tely states: »Der noch so stark eingedickte Saft des Mavacure ist nicht dick genug, um an den Pfeilen zu haften. Also bloss um dem Gift Körper zu geben, setzt man dem eingedickten Aufguss einen andern sehr klebrigen Pflanzensaft bei, der von einem Baum mit grossen Blättern, genannt Kiracaguero, kommt», and again: »Sobald der klebrige Saft des Kiracaguero-Baums dem eingedickten, kochenden Giftsaft zugegossen wird, schwärzt sich dieser und gerinnt zu einer Masse von der Consistenz des Theers oder eines dicken Syrups. Diese Masse ist nun das Curare, wie es in den Handel kommt. Hört man die Indianer sagen, zur Bereitung des Giftes sey der Kiracaguero so nothwendig als der Bejuco de Mavacure, so kann man auf die falsche Vermuthung kommen, auch ersterer enthalte einen schädlichen Stoff, während er nur dazu dient, dem eingedickten Curaresaft mehr Körper zu geben (was auch der Algarobbo und jede gummiartige Substanze thäten)».¹⁾

For throwing light on the question of adding or not adding a number of ingredients in the preparation of arrow-poison, a look through GÜNTER TESSMANN's work »*Die Indianer Nordost-Perus*» (Hamburg 1930), will be useful, as that author gives definite statements as regards the addition, or non-addition, of a number of extra ingredients from a great many tribes, principally blowgun-using, inhabiting the region that also has been studied by KARSTEN. Thence may be compiled the following table, in which TESSMANN's spelling of the tribal names has been retained, and where only such tribes are included about whom he states that they manufacture their poison themselves. The Omagua and Kokoma tribes, for example, buy their poison, and are therefore left out of my under-noted list. In places where the German citations would have been too lengthy, the contents have been summarized in English.

¹⁾ ALEXANDER VON HUMBOLDT's *Reise in die Aequinoctial-Gegenden des neuen Continents*. In deutscher Bearbeitung von HERMANN HAUFF. Vol. 6, pp. 14 and 15. Stuttgart 1862.

Tribe, and page in

TESSMANN.

Koto (p. 195)

Lamisto (p. 224)

Kanelo (p. 251)

Bora (p. 271)

Kandoschi (p. 284)

Uitoto (p. 318)

Muinane (p. 331)

Chíwaro (p. 351)

Mayoruna (p. 371-372)

Tschamikuro (p. 401)

Chebero (p. 424)

Yagua (p. 463)

Ssimaku (p. 495)

Záparo (p. 538)

Notes on the poison.

»Das Gift=*bla* machen die K. selbst aus verschiedenen Lianen, Schlangenzähnen und Ameisen».

Poison prepared from various species of lianas, trees, and Capsicum.

Admixtures occur. See KARSTEN.

»Das Gift=*namixtia* wird aus drei Pflanzen zugleich hergestellt, einer Liane, einem niederen Strauch und einem Zwiebelgewächs, von dem die äussere Schicht genommen wird».

»Das Gift wird aus verschiedenen Bäumen, Lianen und Giftschlangenzähnen gemacht».

»Das Gift=*dlfoi* wird aus der Liane *dlfoiyo* und der Wurzel eines Bäumchens namens *dlfoira* gewonnen».

»Das Gift=*ndmita* wird aus einer Liane und einem Strauch gewonnen von denen beide Teile zusammengetan werden».

Admixtures occur. See KARSTEN.

Poison mainly from a liana. Admixture of Capsicum.

Poison made from two plants, viz. a liana and a shrub.

»Die Pfeilchen . . . waren früher mit selbsthergestelltem Gift . . . aus einer Liane gleichen Namens bestrichen».

Poison prepared from various plants, ants, snakes' fangs, etc.

»Das Gift wird nur aus einer einzigen Liane namens . . . gemacht».

Poison prepared from a single liana, without admixture of snakes' fangs or poisonous animals.

From the data tabulated above we see that definite statements as to extra ingredients being added are in preponderance, a thing that might have been expected. From TESSMAN's statements as to ingredients being added, or not added, no absolute characteristic of the method prevalent

among any given tribe can however be laid down. It is conceivable that among a tribe noted as *non-mixers*, TESSMAN might from a different informant have learnt that the use of admixtures was customary, because that particular individual personally employed such a method, and vice versa. *Where admixtures occur, the principal component is, however, always found to consist of Strychnos species with their dominant element of curarine.*¹⁾ So long as the heart-contracting effect, like that possessed by the pacurine of the pakurú poison, has not through experiments on animals been established in the compounds in question, so long it is impossible definitely to identify «curare» with pakurú.

In my above-cited work (p. 103) I have also stated that the Nonamá-Chocós poison their fishing waters with barbasco, *Tephrosia toxicaria*. KARSTEN in this connection takes exception to my expression that the poisoning takes places «in stagnant water». Of this he writes, in Note 2 on page 73: «I may remark that WASSÉN's statement that among the Chocó the barbasco is used «for poisoning fish in stagnant water» evidently is erroneous. Everywhere in western Amazonas the barbasco is used for fishing in rivers, and the the principle is that the poison shall be taken down by the current. See my *Head-Hunters of Western Amazonas*, pp. 177 sqq.»

On that point I would in the first place remark that I have dealt with Chocó, not with western Amazonas, even though the use of *Tephrosia toxicaria* be wide-spread in the latter region, which is not least apparent from the tabulation of the tribes in the above cited great work of TESSMANN's, which was published earlier than KARSTEN's book. Again,

¹⁾ Cf. THOMAS WHIFFEN: *The North-West Amazons*, London 1915, pp. 144—145: «The most important poison is the curare. It is made from two plants, called by the Witoto *ramu* and *pani*, respectively. The complicated recipe is a treasured hereditary possession. The wood of the *Strychnos toxifera* is the most necessary ingredient in the manufacture of curare. It is pounded in a mortar, and the sap, mixed with water, is strained and boiled with peppers, ants, and a variety of more or less noxious material».

the instance to which I referred concerned a creek adjoining the San Juan River, into which creek the water swung in from the main stream, so that it gave one the impression of actually being more or less »stagnant« in that word's sense of torpidity or sluggishness. It is moreover self-evident that poison will develop a greater effect when applied within a partly enclosed piece of water than if allowed to spread over a large surface and then be »taken down by the current«. I may add that, in his recently published book, »*Atiko Y, Meine Erlebnisse bei den Indianern des Guaporé*« (Copyright Berlin 1937), HEINRICH SNETHLAGE makes the following statement regarding the manner in which the Moré Indians use the poison of a liana in fishing (p. 51): »In stillstehende Gewässer bringen sie gern zerschlagene Stücke einer Giftliane.« This observation would also be incorrect if one were to rely on KARSTEN's descriptions, but there is no ground for such an assumption. SNETHLAGE possesses a thorough personal knowledge of the Indians of the lower Guaporé.

On page 74 KARSTEN cites SANTESSON's preliminary report on his examination of the *Tephrosia* drug referred to on p. 107 in my work, and then adds, in Note 2, an in itself very interesting piece of information from L. LEWIN concerning the species of *Tephrosia* where it is stated that »in the Congo territory in West Africa they are used as additional ingredients in the arrow-poison«. Later in the same note KARSTEN goes on: »Professor LEWIN moreover expressly states that other poisonous plants than the Strychnos are used for the preparation of the curare (for instance Menispermaceae, p. 483). Dr. WASSÉN's categoric denial of this fact is all the more astonishing as he seems to know LEWIN's work«.

For a reply to this most unjustifiable ink-slinging it should be sufficient to point to what I have said in the foregoing as regards the use of additional ingredients, and to the inferences that, at the present state of our knowledge, can be drawn from them. If necessary it may be added that I have never categorically denied any statement found in LEWIN's

work, having had no cause for doing so, and that I moreover am in the habit of carefully citing my authorities.

KARSTEN comments (pp. 75—77) upon my not having unquestioningly followed his guidance — given in one of the chapters of his book »The Head-hunters of Western Amazonas» — in classing the plant »tonga», or »pinde», mentioned by me on pp. 101—102 as used by the Chocó for narcotizing purposes, as a species of *Banisteria*. From what I could gather from ROSENTHAL'S *Synopsis Plantarum Diaphoricarum* I put it down as a possible *Datura sanguinea*. In Note 2 on p. 102 in my work I have, however, by citing REKO, *Magische Gifte*, p. 89, also suggested the possibility of the »tonga» being a species of *Banisteria*. As regards the poisonous properties of *Datura*, etc., as well as the capability of coca to »produce visions» I refer the reader to SANTES-SON'S report here published. From this report it is also clearly evident that KARSTEN'S categorical reference to a *Banisteria* is in this instance extremely dubious.

By way of comparison it may be of interest if it be added here that TSCHUDI from the Quichua and Aymara Indians mentions a plant known as *Wil'ka*, which, although its primary use was that of a laxative medicine, it also served to locate stolen property: »Wenn nämlich Jemand bestohlen worden war und sich deshalb an den Wahrsager wendete, so gab ihm dieser das Getränk *Wil'ka*, das neben der abführenden auch eine narkotische Wirkung hatte; nach dem Indianerglauben brachte nun der Dieb, während der Bestohlene schlief, das entwendete Gut wieder zurück. Es kann kaum bezweifelt werden, dass dies zuweilen der Fall war, wenn nämlich der Dieb erfuhr, dass der Bestohlene den *Wil'ka*-trunk eingenommen habe und nun bei der namenlosen Leichtgläubigkeit und Furchtsamkeit dieser Leute befürchtete, dass ihn selbst eine Zauberwirkung treffen könne». ¹⁾

¹⁾ J. J. von TSCHUDI: *Culturhistorische und sprachliche Beiträge zur Kenntniss des alten Perú*, p. 171. (Denkschriften der Kaiserl. Akad. der Wissenschaften in Wien, XXXIX, 1891).

TSCHUDI gives no botanical determination of *Wil'ka*, and it seems impossible to draw any botanical parallel with the species here already discussed. According to what Professor SANTESSON has kindly told me, as regards any possible laxative action in *Datura* and its related species (*Atropa*, *Hyoscyamus*), the question is somewhat complicated. In experiments carried out on rabbits, with a small dose of atropine of belladonna and hyoscyamus leaves it is possible to relieve constipation in cases where this is due to cramp in the intestine which is relaxed by the drugs just mentioned. In cases of poisoning with the above-mentioned substances diarrhoea is in sporadic cases given as a symptom, though more often constipation results, and at all events it cannot be said that diarrhoea (laxative action) normally follows.

KARSTEN concludes his censorious article (p. 77) with the accusation that I have criticized his «investigations in Eastern Ecuador, carried out under no less than four years», followed by the apparently self-evident information that «it is not possible to study Ecuadorian arrow-poisons in Northern Colombia». These exhibitions of temper are to be regretted. Nowhere in my writings have I criticized KARSTEN's investigations in Ecuador, but only pointed out certain facts connected with Indian preparation of arrow-poisons in Chocó, in doing which I have necessarily had to cite certain controversial contributions of KARSTEN's. Least of all have I been studying arrow-poisons in northern Colombia, where I only paid flying visits in the seaports while travelling to and from Buenaventura. The field of my investigations lay in the western districts of Colombia, all the time south of 5° of northern latitude.

In conclusion I will confine myself to emphasizing that neither for my part will there be forthcoming any further reply to whatever may be adduced by Professor KARSTEN on the subject of the *pakurú* poison.

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The following

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